PARLIAMENT OF AUSTRALIA

Study Buddy or Influencer

Inquiry into the Use of Generative Artificial Intelligence in the Australian Education System

House of Representatives

Standing Committee on Employment, Education and Training

August 2024

CANBERRA

ISBN 978-1-76092-694-6 (Printed version)

ISBN 978-1-76092-695-3 (HTML version)

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This Committee is supported by staff of the Department of the House of Representatives.

Terms of reference

The House of Representatives Standing Committee on Employment, Education and Training will inquire into the issues and opportunities presented by generative artificial intelligence, and comprehensively explore current and future impacts on Australia's early childhood education, schools, and higher education sectors.

The inquiry will include consideration of:

1. The strengths and benefits of generative artificial intelligence tools for children, students, educators and systems and the ways in which they can be used to improve education outcomes;

2. The future impact generative artificial intelligence tools will have on teaching and assessment practices in all education sectors, the role of educators, and the education workforce generally;

3. The risks and challenges presented by generative artificial intelligence tools, including in ensuring their safe and ethical use and in promoting ongoing academic and research integrity;

4. How cohorts of children, students and families experiencing disadvantage can access the benefits of artificial intelligence;

5. International and domestic practices and policies in response to the increased use of generative artificial intelligence tools in education, including examples of best practice implementation, independent evaluation of outcomes, and lessons applicable to the Australian context; and

6. Recommendations to manage the risks, seize the opportunities, and guide the potential development of generative artificial intelligence tools including in the area of standards.

Abbreviations

AAIN	Australian Academic Integrity Network
ACARA	Australian Curriculum, Assessment and Reporting Authority
Accord	Australian Universities Accord Final Report
ACECQA	Australian Children's Education and Care Quality Authority
ACSSO	The Australian Council of State School Organisations
ACU	Australian Catholic University
ADHD	Attention Deficit Hyperactive Disorder
AEU	Australian Education Union
AGD	Attorney-General's Department
AHISA	Association of Heads of Independent Schools of Australia
AHRC	Australian Human Rights Commission
AI	Artificial intelligence
ALIA	Australian Library and Information Association
APA	The Australian Publishers Association
ARC	Australian Research Council
ASA	Australian Society of Authors
ASD	Autism Spectrum Disorder
ASPA	Australian Secondary Principals' Association
ATSE	Australian Academy of Technology Sciences and Engineering
AWS	Amazon Web Services
CAG	Copyright Advisory Group
CDW	Centre for Digital Wellbeing

CRA	Cooperative Research Australia
DISR	Commonwealth Department of Industry, Science and Resources
DoE	Commonwealth Department of Education
ECEC	Early Childhood Education and Care
EdTech	Educational Technology
ESA	Education Services Australia
ESL	English as a second language
EU	European Union
FPCA NSW	Federation of Parents and Citizens Associations of New South Wales
GenAI	Generative artificial intelligence
Go8	Group of Eight
HE	Higher education
ICIP	Indigenous Cultural and Intellectual Property
IEUA	Independent Education Union of Australia
IP	Intellectual Property
ISA	Independent Schools Australia
LLM	Large language model
ML	Machine Learning
MU	Monash University
NCU	National Copyright Unit
NLP	Natural Language Processing
NLU	Natural Language Understanding
NQF	National Quality Framework
NSW	New South Wales
NT	Northern Territory
NTEU	National Tertiary Education Union

OECD	Organisation for Economic Co-operation and Development
PD	Professional Development
PLC	Pymble Ladies' College
QLD	Queensland
R&D	Research and development
RUN	Regional Universities Network
SA	South Australia
SA DFE	South Australia Department for Education
SAC	School-Assessed Coursework
SES	Socioeconomic status
STEM	Science, Technology, Engineering and Mathematics
TAFE	Technical and Further Education
TAS	Tasmania
TCA	Tech Council of Australia
TEQSA	Tertiary Education Quality and Standards Agency
TFSG	Tech for Social Good
UK	United Kingdom
UN	United Nations
UNICEF	United Nations International Children's Emergency Fund
UNESCO	United Nations Educational, Scientific and Cultural Organization
UNSW	University of New South Wales
UoM	University of Melbourne
UoS	University of Sydney
UoSA	University of South Australia
US	United States
UTS	University of Technology Sydney

UTS CREDS	University of Technology Sydney Centre for Research on Education in Digital Society
UWA	University of Western Australia
VATE	Victorian Association for the Teaching of English
VIC	Victoria
WA	Western Australia

List of recommendations

Recommendation 1

2.96 The Committee recommends that the Australian Government:

- **consider making the use of GenAI in education a national priority**
- **create safeguards for all users, especially minors**
- **maximise the opportunities of GenAI education-specific tools and integrate such tools into the school curriculum and practice.**

Recommendation 2

2.97 The Committee recommends that the Australian Government work with State and Territory Governments to ensure that all Australian schools are funded to 100 per cent of the Schooling Resourcing Standard.

2.98 This could support access to high-quality educational GenAI tools by students and educators, especially in marginalised communities.

Recommendation 3

2.99 The Committee recommends that the Australian Government in conjunction with the States and Territories:

- **monitor current pilot programs and evaluate the different approaches to using GenAI education tools in schools, including as a study buddy**
- **build high-quality GenAI education products with datasets based on curriculum, and that meet ESA's product standards, based on the learning outcomes of current pilot programs.**

2.100 The evaluation should include consultations with State and Territory Governments to implement GenAI pilot projects about lessons learned, and how to best design the procurement process.

Recommendation 4

2.101 The Committee recommends that the Australian Government work with key partners to promote GenAI tools that are fit for purpose, meaning they are:

- **quality education products in terms of the design and alignment with educational outcomes**

- **featuring a higher-quality filter to restrict the data used to train an LLM**
- **trained on datasets based on the Australian Curriculum, so inputs are:**
  - **local—reflecting the Australian context, including the curriculum and Indigenous knowledge**
  - **inclusive—for example, gender and disability inclusive.**

Recommendation 5

2.102 The Committee recommends that the Australian Government provide more support to implement the Australian Framework for Generative AI in Schools, including to:

- **expediate the taskforce's creation of an implementation plan for the framework and ESA's product setting work**
- **provide funding to set up virtual and physical hubs to provide expert and technical advice and support to institutions**
- **in conjunction with others—provide GenAI literacy and training, to leaders, teachers, support staff, students, parents and guardians, and policy makers**
- **make certain guiding statements in the framework that general educators are not qualified to implement, apply instead to technical staff.**

Recommendation 6

2.103 The Committee recommends that the Australian Government encourage consistent guidance and uptake of GenAI:

- **in school—education, by working with ACARA to integrate AI literacy across all subjects in the next curriculum review cycle—and to update it regularly to reflect the rapid technological developments, knowledge and skills required**
- **in HE—including updating the threshold standards, and recognises TEQSA's leadership role and efforts.**

Recommendation 7

2.104 The Committee recommends that the Australian Government:

- **allow the use of GenAI by educators and staff in ECEC for certain purposes, such as reducing administrative burden, and defer the use of GenAI by children in ECEC until a framework is developed or the NQF is updated**
- **allow students in primary school to have access to bespoke GenAI tools but restrict certain features and build in more safeguards to make those tools age appropriate, noting that primary school students should not have**

access to certain GenAI products like ChatGPT, which have minimum age requirements.

Recommendation 8

2.105 The Committee recommends that the Australian Government promote safeguards by working with:

- **the eSafety Commissioner, and resourcing the Commissioner to support education providers by giving further guidance on how to use GenAI ethically, safely, and responsibly in educational settings**
- **State and Territory education departments to develop and implement ethical, safe, and responsible AI practices, and voluntary and mandatory guardrails**
- **education providers and the EdTech industry to safely integrate GenAI into Australian schools, universities, and TAFEs, with appropriate internal and external support and safeguards, to:**
  - **realise the benefits of GenAI to educators, other staff, researchers, and students, and to Australia broadly**
  - **actively mitigate risks, including the potential for misuse.**

Recommendation 9

2.106 The Committee recommends that the Australian Government, utilising DISR's expert advisory group:

- **identify unacceptable risks in the education sector, including making the use of GenAI to detect emotion be under an unacceptable risk category for use in schools, like the EU's approach**
- **explicitly consider the design, development, and deployment of AI systems that could be categorised as high-risk in the education sector**
- **have specific regard to the vulnerability of children**
- **identify pre-deployment guardrails for GenAI products for use in the Australian education system.**

Recommendation 10

2.107 The Committee recommends that the Australian Government work closely with key international partners:

- **including the EU, Canada, and US, to promote interoperability regarding requirements and guardrails for GenAI products**

- **including non-governmental stakeholders, to share best practice, identify opportunities, and bolster the evidence base of the impacts of GenAI in education.**

Recommendation 11

3.89 The Committee recommends that the Australian Government:

- **regulate EdTech companies and developers through a system-wide risks-based legal framework**
- **regulate unacceptable risks and high-risk AI systems in the education sector, mandate guardrails, and give the law extraterritorial effect**
- **ensure EdTech companies and developers' products meet established standards, including through testing and independent quality assurance**
- **require EdTech companies and developers to share critical information about how their AI systems are trained, what data it has been trained on, and how algorithms function and affect users**
- **require EdTech companies to provide a Gender Impact Assessment to be completed.**

Recommendation 12

3.90 The Committee recommends that the Australian Government work with AI developers and educational institutions to create robust data protection frameworks. This includes, but is not limited to:

- **outlining students' and other users' rights regarding their personal data**
- **identifying the measures taken to protect users' privacy**
- **limiting, and getting permissions for, the collection, use, and retention of students' data, including:**
  - **that certain types of data be collected**
  - **that data should only be used for educational purposes**
  - **that data be protected from unauthorised access and to have strong encryption practices in place**
  - **where, how, and for how long data can be stored**
  - **the purpose for retrieving data and who can access the data**
  - **that users' data is not stored offshore or sold to third parties.**

Recommendation 13

3.91 The Committee recommends that the Australian Government work with educational providers to mitigate the risks of algorithmic bias and mis- and disinformation by:

- **training educators to teach students how to critique AI generated outputs**
- **mandating that institutional deployers of AI systems in educational settings run regular bias audits and testing**
- **prohibiting the use of GenAI to create deceptive or malicious content in education settings**
- **completing risk-assessments**
  - **for example, identifying and seeking to eliminate bias and discrimination through the data the model is trained on, the design of the model and its intended uses**
  - **mandating to allow independent researchers 'under the hood' access to algorithmic information.**

Recommendation 14

3.92 The Committee recommends that the Australian Government:

- **ensure that the privacy law reforms led by the Attorney-General's Department include strengthening privacy protections for students, including minors, regarding the use of GenAI**
- **encourage the Office of the Australian Information Commissioner to develop an impact assessment measure which can identify the data privacy risks of GenAI tools use in education, and includes pre-deployment measures for implementation of GenAI tools.**

Recommendation 15

4.106 The Committee recommends that the Australian Government invest in training to teach educators of marginalised student cohorts—including disability or learning difficulty, low socio-economic, ESL, and regional, rural or remote—about how GenAI can specifically aid them.

Recommendation 16

4.107 The Committee recommends that the Australian Government, in conjunction with educational providers, encourage educators and other staff to use GenAI tools for appropriate tasks to help streamline parts of teaching and administration.

4.108 For example, lesson planning, timetabling, reporting, and simple grading for yes/no or multiple-choice questions.

Recommendation 17

4.109 The Committee recommends that the Australian Government, in conjunction with educational providers and educators, use data-driven insights from GenAI tools for beneficial purposes.

4.110 This includes to provide individually tailored feedback for students, to respond to identified systemic trends, and to streamline assessment processes.

Recommendation 18

5.79 The Committee recommends that the Australian Government work with State and Territory education departments to train educators and other staff in maximising the benefits of GenAI tools in educational settings, including:

- **training for pre-service teachers**
- **professional development for existing teachers.**

Recommendation 19

5.80 The Committee recommends that the Australian Government support teachers in schools to build students' skills through project-based learning, inquiry-based approaches, and real-world problem-solving activities that demonstrate the risks of the technology.

Recommendation 20

5.81 The Committee recommends that the Australian Government, in collaboration with the State and Territory governments, develop and implement a national training rollout plan for:

- **educators and broader education workforce through professional development and training, including virtual and in-person short courses and learning modules**
- **students, through teacher delivery and online resources**
- **parents and guardians, through information campaigns, school-led meetings, and online resources.**

Recommendation 21

5.82 The Committee recommends that the Australian Government encourage:

- **the use of the existing Digital Technologies Hub as a one-stop online repository of training and resources for educators, students, and parents and guardians to learn and teach about GenAI**
- **a community of practice of AI champions, comprising lead educators and early adopters of AI in schools, TAFEs, and universities.**

Recommendation 22

5.83 The Committee recommends that universities and TAFEs embed GenAI competencies and skills across all courses and degrees.

5.84 The Committee recommends that universities provide pre-service teachers with training in AI literacy in their degrees, including built-in industry-practice.

Recommendation 23

5.85 The Committee recommends that Tertiary Education Quality and Standards Agency work with higher education providers to develop standards and frameworks, including authorship policies, to guide universities in maintaining research and academic integrity regarding GenAI.

Recommendation 24

5.86 The Committee recommends that the Australian Government establish an innovation fund for universities to undertake research and development on the positive and negative impacts and potential application of the use of GenAI in education.

Recommendation 25

5.87 The Committee recommends that the Australian Government establish a Centre for Digital Educational Excellence, modelled on the existing Cooperative Research Centres, which would act as a thought-leader in relation to both the use and development of GenAI in school and university settings.

Foreword

Generative AI (GenAI) presents exciting opportunities and yet high stakes risks for the Australian education system. It offers data-driven insights and administrative efficiencies as well as the potential for enhanced educational experiences and outcomes for all students. This includes students from low socio-economic or ESL backgrounds; with a disability or learning difficulty; from regional or remote areas; and First Nations people. Australia must forge ahead to safely and ethically maximise the benefits of this technology while recognising and mitigating the associated risks.

This inquiry considered how GenAI could be used as an educational tool, and what this should look like in an Australian context. It is the Committee's view that GenAI in education should be a national priority, with a focus on equitable access for all students and educators to high-quality and suitable GenAI education products. If managed correctly, GenAI in the Australian education system will be a valuable study buddy and not an algorithmic influencer.

The Committee found that the best way to implement GenAI education tools into the school system, like study buddies, is by integrating them into the national curriculum, creating and implementing guidelines and polices like the *Australian GenAI in Schools Framework*, and providing product standards like those being developed by Education Services Australia. Furthermore, to make GenAI education tools fit-for-purpose in Australian schools, foundation models, especially large language models (LLM), should be trained on data that is based on the national curriculum. This can make the datasets local to Australia, and inclusive, like being sensitive to gender and culture.

The safety of users was explored as a leading theme during this inquiry, especially relating to the vulnerabilities of minors. The Australian Government is already creating protections and safeguards in the education space by rolling out technology-related reforms to help protect the safety and wellbeing of children, like those related to deep fakes and cyber bullying.

Further risks and challenges arise in the education space regarding GenAI. These relate to the technology itself, the ways it is used, and the data inputs and outputs. Key concerns exist around the potential for over-reliance on GenAI, mis- and disinformation, algorithmic bias, data protection, and transparency.

The Committee shares the concerns raised by some that without strong guardrails, GenAI tools could cause great harm to individuals as it can induce a variety of biases and potentially perpetuate unfairness or even unlawful discrimination. Furthermore, it is paramount that educational providers do not select GenAI tools that involve the storage of users' data offshore or the sale of data to third parties.

The Committee recognises the urgent need to create, implement and enforce mandatory guardrails to help manage the use of GenAI in education. The Australian Government can lead in mitigating the challenges by taking a coordinated and proactive approach, especially with state and territory governments, regulators, industry, educational institutions, educators, and international partners.

The Australian Government also needs to ensure that students in schools, TAFEs, and universities have equitable opportunities to understand and use GenAI tools ethically, safely, and responsibly. Equity and access issues also include having the infrastructure and hardware to enable the use of GenAI, ensuring GenAI is integrated into educational institutions, and having training to use it. A huge uplift is required nationally, including training for pre-service teachers and existing teachers.

GenAI is also having considerable impacts on the broader education workforce, the design and implementation of assessments, and academic and research integrity. These impacts will require adjustments to education policy and practice. TEQSA is actively promoting greater consistency in standards for GenAI in higher education including tough consequences for students and academics who may misuse GenAI technology.

The Committee has made 25 recommendations in this report that focus on:

- maximising the opportunities of GenAI education-specific tools;
- promoting quality education products;
- supporting the implementation of the *Australian GenAI in Schools Framework*;
- integrating AI literacy across all subjects in the next school curriculum review cycle; and
- promoting a range of safeguards and developing standards and frameworks.

While the recommendations put forward in this report are fit to regulate the application of AI in the education sector today, the Committee recognises the prospect that this technology may rapidly outpace the parameters of its terms of reference. The LLM in its present form and its accelerating multimodal capabilities set for imminent public release hold the potential to meaningfully improve educational outcomes, if applied safely. These benefits are foreseeable; however, the trajectory of how AI will advance is not. The frontier models of today may, in retrospect, be viewed as a technology only in its fledgling stage.

Should frontier AI architecture of the future be non-LLM based or should LLMs one day demonstrate capabilities such as advanced reasoning or general-purpose reasoning, the Committee's recommendations may need to be reviewed. A framework designed to regulate GenAI may be unable to withstand or effectively scale to powerful advancements whereby the primary function of this technology is no longer to simply generate content. Government needs to remain aware that regulation may be over-committed to opportunities and risks presented to us at such an early stage in AI's lifespan.

The Committee's report intersects with the findings and recommendations pursued through other inquiry and reform processes, especially the Department of Education's *Australian Framework for Generative AI in Schools*, and the Department of Industry, Science and Resources' *Supporting responsible AI: discussion paper* and the *Australian Government's Interim Response.* It also recognises the work underway by the Attorney-General's Department, and regulators like TEQSA, ACECQA, and the eSafety Commissioner. The Committee's findings and recommendations should be considered alongside those processes.

I would like to thank my parliamentary colleagues on the Committee for their engagement over the course of this inquiry, as well as the Committee's expert panel—Dr James Curran, Professor Nicholas Davis, Professor Leslie Loble AM and Associate Professor Julia Powles—who shared valuable insights and expertise on the use of GenAI in education.

I also thank the individuals and organisations who provided submissions and appeared at public hearings, including current students who shared experiences and suggested ways forward.

Ms Lisa Chesters MP
Chair

1. Introduction

Background

1.1 Generative artificial intelligence (GenAI) is rapidly affecting the global technology landscape and changing the way we learn, work, and interact with each other. The use of GenAI as a tool in education is a recent development that is not widely understood. It comes on the back of the COVID-19 pandemic which introduced more educational technology (EdTech) into our homes as part of remote education systems.

1.2 The introduction of GenAI in education received a mixed response globally and within Australia. Some countries like Italy initially banned the use of ChatGPT due to privacy concerns.[1] Others, like China, encouraged the use of GenAI, but regulated it early.[2] Some Australian jurisdictions banned its use in the school system, and some universities also prohibited GenAI while others embraced it.[3]

1.3 Now, the Australian Government has a framework to encourage schools to use GenAI, and more universities are also integrating GenAI. There is a growing acceptance that GenAI is here to stay and that Australia needs to evolve with it. This trend is being met with increased support for GenAI's integration into the education system, and for guidance and safeguards to assist students, staff, parents and guardians, and developers.

1.4 The potential for GenAI to deliver benefits in the Australian education system, like personalised learning, improved education outcomes, and streamlined administrative processes, is exciting. Worldwide, there is considerable interest in learning how to maximise these opportunities.

1.5 However, there are also significant challenges relating to the use of GenAI, including broader safety and security concerns around ethics, data, and privacy.[4] The particular vulnerability of children heightens many of these risks. The absence of a strong evidence base regarding GenAI's impacts in education, despite the surging availability and use of the technology, is also an underlying concern.[5]

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1 S McCallum, '*ChatGPT banned in Italy over privacy concerns'*, BBC, 1 April 2023, viewed 21 May 2024.
2 L He, '*China AI Regulation*', CNN, 14 July 2023, viewed 30 May 2024.
3 Curtin University, *Submission 41*, p. 3.
4 Australian Human Rights Commission, *Submission 65*, p. 9.
5 Ms Julie Birmingham, First Assistant Secretary, Teacher and Learning Division, Department of Education, *Committee Hansard*, 13 September 2023, p. 3.

1.6 With the rapid uptake of GenAI by students and educators domestically and internationally, and the benefits and risks surrounding that, it is essential to consider how to best integrate GenAI into Australian education and manage its use.

GenAI tools

1.7 Leading artificial intelligence (AI) developers are reaching masses of consumers via their AI systems, including OpenAI (Microsoft is its largest shareholder), Google, Meta, and startups such as Anthropic, Cohere, and France's Mistral. The use of GenAI soared with ChatGPT. On 30 November 2022, OpenAI made ChatGPT freely available to the public. ChatGPT has amassed over a billion hits worldwide per month since February 2023.[6] Since the launch of ChatGPT, the competition to capture the market has intensified, and so too has the use of GenAI, including in the education system.

1.8 On 16 January 2024, one year from the announcement that Microsoft would begin integrating GenAI into Azure, Microsoft launched Co-pilot Pro.[7] The South Australian Department for Education (SA DFE) adopted this technology in its GenAI trial in public schools.[8]

1.9 Google released a GenAI chatbot called Bard on 6 February 2023.[9] It was renamed Gemini in February 2024 to compete with OpenAI's ChatGPT.[10] On 28 November 2023, Amazon introduced a GenAI tool called Amazon Q.[11] Meta released its most powerful AI model called Llama 3, and in April 2024, it released two smaller versions of that system and integrated them into the Meta AI assistant feature across Facebook, Instagram, and WhatsApp.[12]

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6 D Carr, '*ChatGPT's First Birthday is November 30: A Year in* Review', Similarweb, 15 November 2023, viewed 21 May 2024.

7 Y Medhi, '*Bringing the full power of Copilot to more people and* businesses', Microsoft, 15 January 2024, viewed 23 May 2024; Boyd, E, '*General availability of Azure OpenAI Service expands access to large, advanced AI models with added enterprise* benefits', Microsoft, 17 January 2023, viewed 23 May 2024.

8 South Australia Department for Education, *Submission 2*, p. 6.

9 L Wilkinson, '*The rise of generative AI: A timeline of triumphs, hiccups and* hype', CIO Dive, 2 November 2023, viewed 13 August 2024.

10 C Metz, '*Google Releases Gemini, an A.I.-Driven Chatbot and Voice* Assistant', New York Times, 8 February 2024, viewed 21 May 2024.

11 A Barthe, '*Introducing Amazon Q, a new generative AI-powered assistant (preview*)', Amazon, 28 November 2023, viewed 21 May 2024.

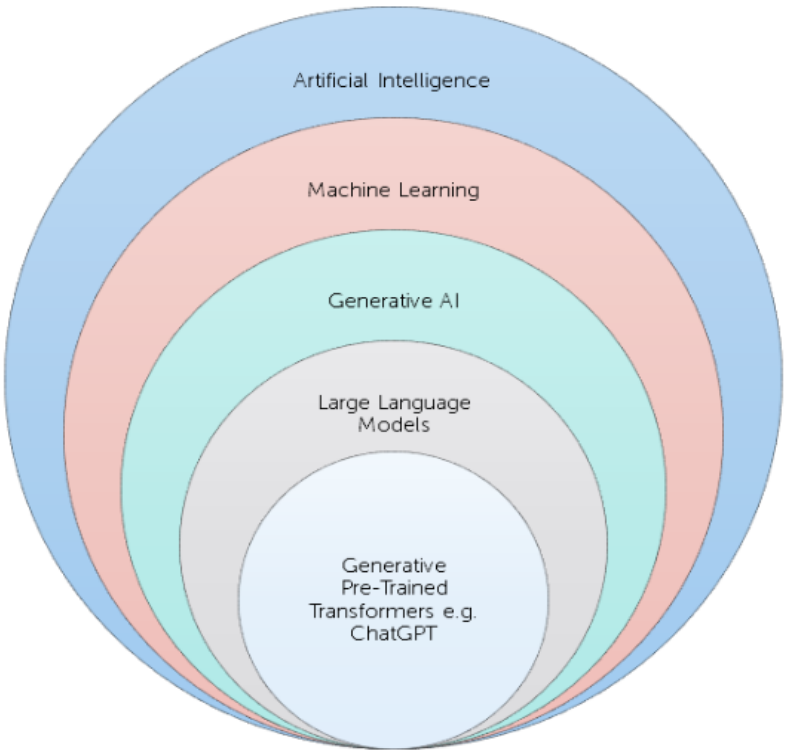
12 '*Meta claims its newest AI model beats some peers. But its amped-up AI agents are confusing Facebook* users'*, ABC*, 19 April 2024, viewed 26 August 2024.

1.10 GenAI is an economic game changer. Amazon Web Services (AWS) asserted that GenAI could produce $315 billion in economic value to Australia over the next decade.[13] The Tech Council of Australia forecast that GenAI could contribute between $45–$115 billion in annual economic value to Australia by 2030. It predicted that benefits would be derived from the adoption of GenAI in existing industries, and from the development of AI products and services to create new jobs and businesses.[14]

Understanding GenAI

1.11 As the name suggests, GenAI generates content, including text, code, images, music, audio and video. GenAI is a subset of AI, and GenAI products are broadly situated within EdTech. Figure 1 represents the relationship between key concepts regarding GenAI:

Figure 1.1 Relationship of key concepts



[13] Ms Min Livanidis, Head of Digital Trust, Cyber and Data Policy, Australia and New Zealand, Amazon Web Services, *Committee Hansard*, 29 November 2023, p. 5.

[14] Mr Ryan Black, Head of Policy and Research, Tech Council of Australia, *Committee Hansard*, 11 October 2023, p. 1.

Source: 'Glossary of AI terms, MinterEllisonRuddWatts, viewed 13 August 2024.

1.12 AWS defines AI as:

> the use of machine learning (ML) and related technologies that use data to train algorithms and predictive models for the purpose of enabling computer systems to perform tasks normally associated with human intelligence or perception, such as computer vision, natural language processing, and speech recognition.[15]

1.13 GenAI uses an emerging area of ML, called deep learning, to generate new content based on user prompts. The University of Sydney (UoS) explained that GenAI is:

> a rapidly evolving class of computer algorithms able to create digital content—including text, images, video, music and computer code. They work by deriving patterns from large sets of training data that become encoded into predictive mathematical models, a process commonly referred to as 'learning'… People can then use interfaces like ChatGPT or MidJourney to input prompts—typically instructions in plain language— to make Gen-AI models produce new content.[16]

1.14 The very large ML models that drive GenAI are commonly referred to as foundation models.[17] A specific type of foundation model is a large language model (LLM), which focuses on language tasks. The LLM is trained on large amounts of data scraped from the Internet, hence the data and outputs can be biased, inaccurate, and outdated.[18] LLMs cannot identify whether information is factual and truthful. The University of Melbourne (UoM) explained that:

> There is no inner logic, no reasoning, no repository of knowledge, and no explicit guidance to anything it does except the numerical match scores that provide segment continuation rankings. It simply recognises patterns in data and produces answers based on those patterns.[19]

1.15 LLMs sit behind and power GenAI tools that end-users employ, such as GenAI chatbots like ChatGPT. To illustrate, if you type a user prompt such as a question into ChatGPT, that prompt is processed by an LLM to produce a response.[20]

1.16 AI chatbots are being used in many sectors, including in education. Google described AI chatbots as:

> …[A]pps or interfaces that can carry on human-like conversation using natural language understanding (NLU) or natural language processing (NLP) and machine learning (ML). AI chatbots differ from standard chatbots in that they

15 Amazon Web Services (AWS), *Submission 85*, p. 3.
16 The University of Sydney *Submission 44,* p. 3.
17 AWS, *Submission 85*, p. 3.
18 The University of Melbourne (UoM), *Submission 34*, p. 7; National Catholic Education Commission, *Submission 81*, p. 4.
19 UoM, *Submission 34*, p. 4.
20 S Clarke, D Milmo, G and Blight, 'How AI chatbots like ChatGPT or Bard work – visual explainer', *The Guardian*, 1 November 2023, viewed 21 May 2024.

leverage large language models (LLMs) versus traditional conversation flows and pre-programmed responses to generate responses to text and voice inputs.[21]

Parliamentary inquiries

1.17 There are other parliamentary inquiries underway on AI in Australia. In June 2023, the Parliament of New South Wales launched an inquiry into AI.[22] That inquiry received some evidence about GenAI and education, for instance, from the Australian Education Union (AEU) and UoS.

1.18 A Senate Select Committee on Adopting AI was also established on 26 March 2024 to inquire into the opportunities and impacts of the uptake of AI technologies in Australia.[23] The Senate Committee intends to report to the Parliament in September 2024.

Referral and conduct of inquiry

1.19 On 24 May 2023, the House Standing Committee on Employment, Education and Training (the Committee) adopted an inquiry into the use of GenAI in the Australian education system, following a referral from the Minister for Education, the Hon Jason Clare MP. The Committee was asked to focus on the issues and opportunities presented by GenAI and its impacts on Australia's early childhood education, schools, and higher education (HE) sectors. The Terms of Reference can be found in the preliminaries part of this report.

1.20 The Committee announced its inquiry in a media release on 25 May 2023, and called for written submissions. The Committee received over one hundred written submissions, which are listed in Appendix A.

1.21 The Committee appointed a panel of AI subject matter experts to support the inquiry. Members of the expert panel included:

- Dr James Curran, Chief Executive Officer, Grok Academy
- Professor Nicholas Davis, Industry Professor of Emerging Technology and Co-Director of the Human Technology Institute, University of Technology Sydney (UTS)
- Professor Leslie Loble AM, Industry Professor, UTS
- Associate Professor Julia Powles, Director of the Tech & Policy Lab, University of Western Australia (UWA).

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21 Google Cloud, 'AI Chatbot', *Google*, 24 March 2024, viewed 21 May 2024.

22 Parliament of New South Wales, '*Artificial intelligence (AI) in New South Wales*', 27 June 2023, viewed 13 August 2024.

23 Parliament of Australia, '*Select Committee on Adopting Artificial Intelligence (AI)*', 26 March 2024, viewed 13 August 2024.

1.22 The purpose of the expert panel was to provide the Committee, at the outset of the inquiry, with an overview of key issues and trends regarding GenAI and education, and to help shape the collection of evidence. The panel acted as a sounding board and provided an opportunity for the Committee to engage with a group of experts who followed the inquiry and could comment on the breadth of evidence presented to it. The public hearing program was opened and closed with a meeting of the expert panel.

1.23 The Committee held 15 public hearings virtually and in Canberra, Melbourne, and Sydney. The Committee visited Monash University (MU), Pymble Ladies' College (PLC), and The Grange P–12 College. These site visits were undertaken as case studies of the breadth and degree of integration of GenAI in education. Transcripts for all public hearings are available on the Committee's website, and details of the public hearings are listed in Appendix B.

1.24 Most of the evidence received by the Committee focussed on GenAI in schools and universities. It also focussed on GenAI tools, especially AI chatbots, that generate text in response to user prompts.

Report outline

1.25 This report consists of five chapters, including this introduction.

- Chapter two provides an overview of the use of GenAI in the Australian education system. It considers domestic approaches and international best practice for GenAI in education. It focuses on how to design and integrate Gen-AI education tools in the Australian context; highlighting our policies and guidance, curriculum, and development of product standards. It also examines which rules, guardrails, and regulatory responses may assist in managing its use.
- Chapter three discusses key risks posed by GenAI in education. It looks at safety, wellbeing, and security concerns, such as algorithm bias, overreliance on technology, and privacy matters. The chapter also considers suggested mitigation and protection measures by government, EdTech companies, and educational providers.
- Chapter four examines the opportunities that using GenAI tools can offer in the Australian education system. It considers how the technology could support students and teachers. It discusses the potential benefits of personalised use and support for all students, and GenAI's additional relevance to marginalised and diverse cohorts. It also discusses the opportunity to bridge the digital divide and improve equity of access to GenAI tools in education.
- Chapter five considers possible effects on the role of educators, the broader workforce and teaching. It highlights the need to build AI literacy and capacity across the education system. Upskilling pre-service and existing teachers is critical to educate students, and their parents and guardians about GenAI. It also looks at issues around assessment, and academic and research integrity, and the need for a strong evidence-base about the effects of GenAI.

Acknowledgements

1.26 The Committee would like to thank everyone who provided written submissions, attended public hearings, and hosted and participated in the Committee's site visits. The Committee extends its gratitude to the expert panel for providing thoughtful and helpful input. The Committee was impressed by the depth of knowledge and enthusiasm displayed by those who contributed to this inquiry.

2. Integration practices and policies

Domestic uptake of GenAI in education

2.1 The adoption of generative artificial intelligence (GenAI) in the education system in Australia varies widely at a jurisdictional and institutional level. This is due to a multitude of reasons, such as technical challenges, resource constraints, and attitudes. Initially in Australia, the use of GenAI was banned in certain public and independent schools, and in some universities. Conversely, it was embraced by other schools and higher education (HE) institutions.[1]

2.2 Now, students and staff in many schools, TAFEs, and universities, are experimenting with GenAI to perform tasks of differing complexity. Some of these institutions have begun 'teaching practical courses to prepare students for life in an AI-driven world'.[2] The Committee heard that the most utilised GenAI tool in the Australian education system is ChatGPT, which generates text.[3] There is still a gap, however, in the use of GenAI in educational settings in Australia.

- Early childhood education and care (ECEC): stakeholders had difficulty in identifying examples of use, indicating that there is no limited use.[4] They drew a distinction between the use of GenAI by children in ECEC, compared to use by educators or other staff who could use it as an educational tool and to reduce administrative burden.[5]
- Schools: some jurisdictions initially banned GenAI in schools.[6] Since then, South Australia (SA) has held pilot trials of GenAI in schools,[7] as well as New South Wales (NSW).[8] There are basic issues around access to the technology in Northern Territory (NT).[9] The evidence indicates that GenAI is being used by less

1 Australian Academy of Technological Sciences and Engineering (AATSE), *Submission 14*, pp.1–3; Independent Schools Australia (ISA), *Submission 22*, p. 15; Australian Human Rights Commission (AHRC), *Submission 65*, p. 11.

2 Ms Delia Browne, Director, National Copyright Unit, Copyright Advisory Group, *Committee Hansard*, 29 January 2024, pp. 8–10.

3 The University of Sydney, *Submission 44,* Appendix C, p. 1.

4 Ms Veronica Yewdall, Assistant Federal Secretary, Independent Education Union of Australia, *Committee Hansard*, 11 October 2023, p. 8; Mr Chris Davern, Assistant Secretary, Strategic Policy Branch, Department of Education (DoE), *Committee Hansard*, 6 March 2024, pp. 4–5.

5 Mr Davern, DoE, *Committee Hansard*, 6 March 2024, p. 5; Mr Brad Hayes, Federal Secretary, Independent Education Union of Australia (IEUA), *Committee Hansard*, 11 October 2023, p. 8; Ms Julie Birmingham, First Assistant Secretary, Teaching and Learning Division, Department of Education (DoE), *Committee Hansard*,13 September 2023, p. 5.

6 Curtin University, *Submission 41*, p. 3.

7 South Australia Department for Education (SA DFE), *Submission 2*, p. 7; Dr James Curran, Chief Executive Officer, Grok Academy, *Committee Hansard*, 20 March 2024, p. 1.

8 Dr Curran, Grok Academy, *Committee Hansard*, 20 March 2024, p. 1.

9 Ms Birmingham, DoE, *Committee Hansard*, 6 March 2024, p. 2.

by younger primary school students than their older counterparts.[10] Grok Academy supported 'K-12 teachers with free professional learning resources and students with free online and unplugged, self-paced cloud learning resources aligned with the national Curriculum'.[11] Some schools like Pymble Ladies' College (PLC) are ahead of the curve in adopting and integrating GenAI.

- HE: evidence suggests discrepancies in the uptake of GenAI in the HE sector, from fairly progressed uptake to none.[12] Some institutions already have their own policies and approaches towards GenAI, like the University of Sydney and the University of Melbourne (UoM), while other universities and affiliated student groups are collaborating on how to best use GenAI in educational settings, such as Monash University (MU) and Monash DeepNeuron.[13] The Tertiary Education Quality and Standards Agency (TEQSA) has been stepping in to promote greater consistency.

Guidance on integration

2.3 As GenAI is already being used in the Australian education system by many students and educators, the Committee heard repeated calls for consistent guidelines, policies, and guardrails to help maximise the technology's benefits whilst mitigating its risks.[14] Educational providers and educators are also asking for support to select appropriate GenAI tools.[15]

Age suitability

2.4 During the inquiry, the Committee heard mixed views about whether it was suitable to integrate GenAI tools into education depending on the age of the student. These ranged from:

- it may be appropriate to restrict use for children in ECEC and in primary school;[16]
- primary school students could use GenAI if there is age-appropriate training;[17] and
- it may not be necessary to have age limitations at all.

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10 Mr Anthony England, Director, Innovative Learning Technologies, Pymble Ladies' College (PLC), *Committee Hansard*, 29 January 2024, p. 5.

11 AWS, *Submission 85*, p. 5.

12 Mr Samuel Nikolsky, Director, Wyndham Tech School, Victoria University, *Committee Hansard*, 13 March 2024, p. 21.

13 Ms Raphaella Revis and Mr Leonid Shchurov, University of Technology Sydney, *Committee Hansard*, 30 January 2024, p. 35.

14 Professor Nicholas Davis, Industry Professor of Emerging Technology and Co-Director, Human Technology Institute, University of Technology Sydney (UTS), *Committee Hansard*, 20 March 2024, p. 7.

15 Ms Birmingham, DoE, *Committee Hansard*, 6 March 2024, p. 6.

16 ISA, *Submission 22*, p. 4; Maeve, Year 12 Student, The Grange P–12 College, *Committee Hansard*, 13 March 2024, p. 4.

17 Independent Education Union of Australia, *Submission 26*, p. 3.

2.5 One key concern raised at both PLC and The Grange P–12 College was the risk of over-reliance on GenAI and possible negative impacts on students' development.[18] A student at The Grange P–12 College cautioned against students using artificial intelligence (AI) at a young age, stating:

> If we do start implementing AI at early ages, it makes [students] think that they'll have it with them through all the stages of life and it doesn't prepare them for the real world… you have to rely on yourself and your independence.[19]

2.6 There are many other considerations on age suitability to use GenAI.

- Greater risks exist for children, including around vulnerability and safety.[20]
- There are many privacy risks around students' personal data, including for profiling and grooming.[21]
- Children need to 'develop healthy social-emotional skills and become critical and creative learners before they experience the world of GenAI.[22]
- Risks around the use of screen time for children.[23]
- The utility of traditional learning methods and teaching practices.[24]
- Human interaction, creating relationships with other children and adults, and a play-based curriculum, are central for younger children.[25]
- Informed consent is required, including from students themselves.[26]
- Children who do not get parental consent would not have access to GenAI tools like their peers.[27]

2.7 The Australian Human Rights Commission (AHRC) has recommended having consistent national guidelines to ensure the responsible and ethical use of GenAI tools in the Australian education system, including guidance on what age is appropriate for students to start using GenAI.[28] Independent Schools Australia (ISA) called for 'age-appropriate implementation of AI tools in education [that are] evidence-based, reviewed and evaluated'.[29]

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18 Pymble Ladies' College, *Submission 93*, p. 8.
19 Maeve, The Grange P–12 College, *Committee Hansard*, 13 March 2024, p. 4
20 Professor Leslie Loble AM, Industry Professor, University of Technology Sydney (UTS), *Submission 49*, p. 3.
21 Australian Council of State School Organisations (ACSSO), *Submission 25*, p. 20; Australian Children's Education & Care Quality Authority, 'Review of Child Safety Arrangements under the National Quality Framework', December 2023, viewed 13 August 2024, p. 27.
22 ISA, *Submission 22*, p. 4.
23 Mr Davern, DoE, *Committee Hansard*, 6 March 2024, pp. 4-5.
24 Maeve, The Grange P–12 College, *Committee Hansard*, 13 March 2024, p. 4; Samidha, Year 12 Student, The Grange P–12 College, *Committee Hansard*, 13 March 2024, p. 4.
25 Mr Hayes, IEUA, *Committee Hansard*, 11 October 2023 p. 8; Mr Davern, DoE, *Committee Hansard*, 6 March 2024, pp. 4–5.
26 Regional Universities Network (RUN), *Submission 40*, p. 3.
27 RUN, *Submission 40*, p. 3.
28 Mrs Lorraine Finlay, Human Rights Commissioner, Australian Human Rights Commission (AHRC), *Committee Hansard*, 4 October 2023, pp. 16–17.
29 ISA, *Submission 22*, p. 4.

2.8 The Commonwealth Department of Education's (Commonwealth DoE) *Australian Framework for Generative AI in Schools* does not specify at what age students should start employing GenAI. However, it is highly pertinent that there are minimum age requirements to access certain GenAI tools.[30] For example, OpenAI's website states that 'ChatGPT is not meant for children under 13, and [it] require[s] that children aged 13 to 18 obtain parental consent before using ChatGPT'.[31] This means that primary school students should not be using it, and high school students can access it if they have consent from their parents or guardians.

ECEC and HE

2.9 The Commonwealth DoE advised that there are no current plans to have a taskforce or further framework—like the *Australian Framework for Generative AI in Schools*—for ECEC or HE.[32] However, there has been activity in ECEC and HE by the eSafety Commissioner, and the national regulators for ECEC and HE, the Australian Children's Education and Care Quality Authority (ACECQA), and TEQSA.

2.10 Regarding ECEC, ACECQA conducted a review in December 2023 into child safety arrangements under the National Quality Framework (NQF). It considered whether the NQF was fit-for-purpose in light of the emergency of artificial intelligence (AI).[33] The NQF provides a regulatory scheme of laws and regulations, quality standards, and approved learning frameworks, aimed at protecting children's safety, health and wellbeing.[34]

2.11 ACECQA's review identified AI as an emerging issue and referred to guidance on GenAI risks for ECEC from the *eSafety Commissioner's GenAI Position Statement*.[35] It found that approved providers and educators do not always have the confidence and skills to ensure an child safe online environment, including regarding risks of AI.[36] In early 2024, Education Ministers agreed in principle to ACECQA's final report recommendations, and the Commonwealth DoE has indicated that the NQF will be updated.[37]

2.12 It is also important to highlight that throughout the inquiry, stakeholders had difficulty identifying examples of use of GenAI in ECEC.[38] Greater risks posed by GenAI apply

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30 Association of Heads of Independent Schools of Australia, *Submission 82*, p. 5; Australian Science and Mathematics School, *Submission 31*, p. 2.

31 Open AI Help Centre, 'Is ChatGPT safe for all ages?', *OpenAI*, viewed 13 August 2024.

32 Mr Davern, DoE, *Committee Hansard*, 6 March 2024, p. 5.

33 Ms Birmingham, DoE, *Committee Hansard*, 6 March 2024, p. 5.

34 The Hon Jason Clare MP, Minister for Education, 'Report into Safety in Early Childhood Education and Care Settings', *Media Release*, 21 December 2023, viewed 13 August 2024.

35 eSafety Commissioner, 'Generative AI – position statement', eSafety Commissioner, 15 August 2023, viewed 21 May 2024; Mr Davern, DoE, *Committee Hansard*, 6 March 2024, p. 5.

36 ACSSO, Submission 25, p. 20; Australian Children's Education & Care Quality Authority, *Review of Child Safety Arrangements under the National Quality Framework*, December 2023, viewed 13 August 2024, p. 4.

37 Mr Davern, DoE, *Committee Hansard*, 6 March 2024, p. 4.

38 Mr Hayes, IEUA, *Committee Hansard*, 11 October 2023 p. 8; Mr Davern, DoE, *Committee Hansard*, 6 March 2024, pp. 4–5.

to children in ECEC than older students. There could be a role for educators in ECEC to use it, for instance to reduce the administrative burden.[39]

2.13 In the HE sector, institutions have started to implement their own GenAI use policies. Some university peak bodies argued that each institution should take a localised approach, while other institutions sought clear and consistent standards across the sector.[40] TEQSA has provided guidance, as have other key bodies like the Australian Academic Integrity Network (AAIN).[41] TEQSA has been holding conferences and has been publishing materials about GenAI use in higher education settings online.[42] TEQSA's Chief Commissioner informed all HE providers of a request to provide action plans on how they are addressing risks posed by GenAI, especially risks to integrity and to the award of degrees.[43]

2.14 On 25 February 2024, Minister Clare released the Australian Universities Accord Final Report (the Accord). It contains forty-seven recommendations for HE reforms.[44] The Accord noted the rapid development of GenAI in the HE sector, how it challenges 'traditional approaches to teaching and assessment', and its potential to improve research productivity.[45] Minister Clare stated that 'the Accord will… help us build a better and fairer education system where no one is held back, and no one is left behind'.[46]

Australian Framework for Generative AI in Schools

2.15 In December 2023, the Australian Government released the *Australian Framework for Generative AI in Schools,* which came into effect in January 2024. The *Australian Framework for Generative AI in Schools* encourages the use of GenAI in all Australian schools and aims to guide the responsible and ethical use of GenAI tools to help students, schools, and society to realise the benefits of GenAI while recognising its risks. The *Australian Framework for Generative AI in Schools* can be used by school leaders, teachers, support staff, service providers, students, parents and guardians, and policy makers.[47]

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39 Mr Hayes, IEUA, *Committee Hansard*, 11 October 2023 p. 8.

40 Mr Nikolsky, Victoria University, *Committee Hansard*, 13 March 2024, p. 21; Group of Eight (Go8), *Submission 63*, p. 2.

41 AHRC, *Submission 65*, p. 17.

42 Mr Davern, DoE, *Committee Hansard*, 6 March 2024, p. 4.

43 Mr Davern, DoE, *Committee Hansard*, 6 March 2024, p. 4.

44 The Hon Jason Clare MP, 'Release of the Australian Universities Accord', *Media Release*, 25 February 2024, viewed 30 May 2024.

45 Department of Education (DoE), *Australian Universities Accord Final Report*, 25 February 2024, viewed 26 August 2024, pp. 61-62.

46 The Hon Jason Clare MP, 'Release of the Australian Universities Accord', *Media Release*, 25 February 2024, viewed 30 May 2024.

47 DoE, *Australian Framework Generative Artificial Intelligence (AI) in Schools*, 31 January 2024, viewed 21 May 2024.

2.16 The National AI in Schools Taskforce, comprising representatives from all jurisdictions, developed this evidence-based guidance. The *Australian Framework for Generative AI in Schools* will be reviewed every 12 months or as needed and is based on three goals: education outcomes, ethical practices, and equity and inclusion. It contains 25 guiding statements aligning to the following principles:

- teaching and learning
- human and social wellbeing
- transparency
- fairness
- accountability
- privacy, security and safety.[48]

2.17 Some of the expert panel members shared their differing views about the *Australian Framework for Generative AI in Schools*. Dr James Curran, Chief Executive Officer of the Grok Academy, said it was 'allowing schools to have more principled conversations about where they're going'.[49] Associate Professor Julia Powles, Director of University of Western Australia Tech and Policy Lab, commented that it 'needs to be a meaningful guiding framework rather than what it is right now...'.[50] Professor Leslie Loble AM, Industry Professor at the University of Technology Sydney (UTS), thought it was a 'fabulous first step' and supported further work. However, Professor Loble cautioned against creating an even greater workload for educators, for instance, undertaking quality assurance of GenAI tools.[51]

Implementation and GenAI tools

2.18 The Commonwealth DoE advised that the taskforce is creating an implementation plan for the *Australian Framework for Generative AI in Schools*. States, Territories, and non-government school authorities are responsible for their own education systems and will need to implement it. The Commonwealth DoE highlighted the need for clear expectations about the kinds of GenAI applications that are available to schools, and national technical standards for schools to understand. For instance, the Hon Jason Clare MP, Minister for Education, recently advised that schools should not use GenAI products that sell students' data.[52]

2.19 To help implement the *Australian Framework for Generative AI in Schools*, Education Ministers provided $1 million to Education Services Australia (ESA) to set 'product expectations' for GenAI tools in education, including to protect students' data and privacy.[53] The English Teachers Association NSW added that 'decisions about the

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48 DoE, *Australian Framework Generative Artificial Intelligence (AI) in Schools*, viewed 21 May 2024.
49 Dr Curran, Grok Academy, *Committee Hansard*, 20 March 2024, p. 1.
50 Associate Professor Julia Powles, Director, Tech and Policy Lab, University of Western Australia, *Committee Hansard*, 20 March 2024, p. 5.
51 Professor Loble, UTS, *Committee Hansard*, 20 March 2024, p. 8.
52 Ms Birmingham, DoE, *Committee Hansard*, 6 March 2024, p. 2.
53 Ms Birmingham, DoE, *Committee Hansard*, 6 March 2024, pp. 1–2.

suitability of tools could be made at scale to ensure that they are trustworthy and equitable without undermining teachers' pedagogy'.[54]

2.20 Professor Nicholas Davis, Industry Professor of Emerging Technology and Co-Director at the Human Technology Institute, UTS, also highlighted the opportunity for the Australian Government to set product standards:

> … there are currently no standards for efficiency, effectiveness, performance and pedagogical efficacy of ed tech and similar products in Australia. It is a fantastic opportunity for the federal government to set the standards for what is expected, including the transparency of those systems and proving that there is some theory behind them… Currently, your average school is very poorly placed to do thoughtful procurement of these systems, so advice on standards et cetera would be critical.[55]

2.21 Minister Clare stated that Australia is 'entering an age where AI has got to be part of education'.[56] There are contrasting views about who should be responsible for providing GenAI tools to schools, and how they should be rolled out. Several options for accessing GenAI tools in education were identified below.

- Individuals and educational institutions could use publicly available GenAI tools for free. However, they raise more risks than bespoke products do. Another option would be to pay for premium subscriptions for those tools.[57]
- Schools or State/Territory governments could run pilot programs and scale them. For example, South Australia Department for Education (SA DFE), NSW, and PLC have been pioneering this.
- The federal government could build a foundation model from scratch or work with companies to re-train an existing foundation model/large language model (LLM) to include particular inputs and filters/constraints on data.[58]

2.22 Professor Loble warned that existing GenAI products are 'not quality education products' and behind them sit LLMs of differing quality. Professor Loble argued that when products are procured for schools, the inclusion of upfront requirements is crucial, such as independent quality assurance. Professor Loble further stated that 'it's really important that we know that that is a product that is linked to the best evidence we've got about how students learn and what will support the professionalism and agency of teachers'.[59]

2.23 The quality of GenAI education tools could also be improved if the foundation models are trained on datasets based on the national curriculum. This would promote data inputs that are relevant, and local to Australia, and inclusive; such as being sensitive

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54 English Teachers Association NSW, *Submission 64*, p. 6.
55 Professor Davis, UTS, *Committee Hansard*, 6 September 2023, p. 1.
56 National Catholic Education Commission, 'Artificial intelligence here to stay says Federal Education Minister', *Media Release*, 8 June 2023, viewed 13 August 2024.
57 RMIT Blockchain Innovation Hub Researchers, *Supplementary Submission 18.1*, p. 1.
58 Dr Curran, Grok Academy, *Committee Hansard*, 20 March 2024, p. 7.
59 Professor Loble, UTS, *Committee Hansard*, 20 March 2024, p. 8.

to gender and culture.[60] It could also assist with mitigating some of the risks with the outputs of GenAI tools. As TEQSA commented:

> … consideration should be given the data on which AI is trained to ensure local contexts are adequately represented. This is important to avoid erasing Australian and indigenous culture in a sea of US-centric internet content. Setting down requirements for those creating AI models to be purposeful and considered about the training data can help create inclusive and diverse AI systems.[61]

2.24 Professor Davis supported the idea of the government training an LLM. Professor Davis explained that it would be worth it as 'a public good for Australia, for our neighbourhood and for our relationships to have the research and the investment in training and validating systems … [that] can be used at low cost by anyone who wants them'.[62] This option would promote equitable access to a high-quality GenAI product in the Australian school system.

2.25 Dr Curran explained that it would cost over $100 million to build a foundation model. Dr Curran stated that the federal government would possibly need 'to rely on a small number of companies with the resources to be able to build these foundational models'.[63] He further stated:

> Finally, on the government platform; to be clear, when I said $100 million, that wasn't to say that I don't think we should do it. But the amounts of money we're talking about to do that are serious. Thinking about some of our other large infrastructure projects—and we should think about this like an infrastructure project on the scale of the NBN—I suspect that these projects do take longer and are far harder than we think. I think a more likely scenario is to choose a partner and say, 'We have some particular constraints on what we want in the training data.' Whether that's with OpenAI, or Amazon or anyone else, we'd say, 'We want to pay for a model to be retrained that has a much higher-quality filter on the text that you've included in the fundamental model.[64]

2.26 The importance of content filtering is highlighted by SA's GenAI in schools pilot project, as described below.

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60 Centre for Digital Wellbeing (CDW), *Submission 83*, p. 12; Tertiary Education Quality and Standards Agency (TEQSA), *Submission 33*, p. 9.

61 TEQSA, *Submission 33*, p. 9.

62 Professor Davis, UTS, *Committee Hansard*, 20 March 2024, p. 4.

63 Dr Curran, Grok Academy, *Committee Hansard*, 20 March 2024, p. 2.

64 Dr Curran, Grok Academy, *Committee Hansard*, 20 March 2024, p. 7.

Box 4.1 SA DFE pilot project

The South Australia Department for Education (SA DFE) ran a GenAI in schools pilot project. The project began in 2023 'with a proof of concept with Microsoft to integrate the 'Open AI' platform (the platform currently hosting ChatGPT) into the department's Microsoft Azure Tenancy (private cloud).' The trial included support for teachers and students to use it, and observations were recorded about its impacts.

The SA DFE explained that the approach of having a customised GenAI chatbot:

- 'allows greater control over what data or information can be accessed through the platform
- provides the department with control over the data received through the platform
- reduces the possibility of inappropriate content being provided, meaning it is more appropriate for teaching and learning purposes'.[65]

The SA DFE's pilot project, which was considered a success, highlights the importance of data inputs:

> From a technology perspective, the performance went well. Our guardrails were robust and there was high usage. The product was highly reliable, and the content filtering worked well. We did refine as we went along, making sure that the content filters were finely tuned at all times and were blocking what they needed to, but not blocking what they didn't need to. The educator and student experiences were positive. They reported that they actively enjoyed using EdChat and found it to be useful for both teaching and learning.[66]

Integrating GenAI into curriculum

Country case studies

2.27 In 2019, Singapore became the first country in South-East Asia to develop a national AI strategy.[67] Singapore's strategy includes the use of AI in education as a national priority.[68] Singapore's policies highlight the need for data privacy, transparency, and accountability.[69] Singapore is giving its students more agency in their learning, while still maintaining the fundamentals of education, that is, literacy, and numeracy, and a strong curriculum.[70] The Singaporean Government also provides national

65 SA DFE, *Submission 2*, p. 7.
66 Ms Julia Oakley, Executive Director, System Performance, South Australia Department for Education, *Committee Hansard*, 5 February 2024, p. 3.
67 ISA, *Submission 22*, p. 12.
68 Professor Loble, UTS, *Committee Hansard*, 6 September 2023, p. 11.
69 ISA, *Submission 22*, p. 12.
70 Professor Loble, UTS, *Committee Hansard*, 6 September 2023, p. 11.

professional development (PD) for existing and pre-service teachers to improve their comprehension and use of AI tools.[71]

2.28 The Singaporean Ministry of Education is partnering with industry to develop AI tools to assist with teaching and learning.[72] The Australian Council of State School Organisations (ACSSO) commented that 'these tools are aligned with the curriculum and are subject to rigorous evaluation to ensure they meet educational objectives'.[73] Singapore held a pilot project on personalised education through adaptive learning and assessment. The pilot project was 'so successful in improving student educational outcomes and assisting teachers with their workload' that the Singaporean Government has since invested in a ten-year collaboration with an EdTech company, and the National University of Singapore is also involved.[74]

2.29 Finland has 'integrated AI tools into the curriculum to enhance student personalised learning experiences'.[75] There is a focus on disinformation and building a healthy relationship with technology from K–12.[76] Students also learn about ethical considerations of AI and how to use tools safely.[77]

2.30 ISA noted that other countries have similar approaches:

> As of 2021, eleven countries have officially endorsed and implemented a K–12 AI curriculum, including India, China, Belgium, and South Korea with other countries such as Germany trialling pilot programs to allow teachers and students to explore the possibilities of AI in education within specific guidelines.[78]

Curricula in Australia

2.31 In the domestic context, AI is being integrated into the national curriculum. The Australian Curriculum describes what students should learn in schools, as set by Australian Curriculum, Assessment and Reporting Authority (ACARA). It is up to State and Territory government authorities to decide how to implement the Australian Curriculum, and this varies between jurisdictions.[79] Moreover, teachers decide how to deliver curriculum content through their teaching practices and activities, and this also differs.[80] There is a need to create more consistency, and the Commonwealth DoE said the focus should be on the 'translation piece' on implementation of the Australian Curriculum. The Commonwealth DoE contended to instead focus on

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71 ACSSO, *Submission 25*, p. 8; Associate Professor Kate Thompson, Associate Professor of Digital Pedagogies, School of Teacher Education and Leadership, Queensland University of Technology, *Committee Hansard*, 5 February 2024, p. 10.
72 ACSSO, *Submission 25*, p. 8; Claire Field, *Submission 70*, p. 19.
73 ACSSO, *Submission 25*, p. 8.
74 Claire Field, *Submission 70*, p. 19.
75 ISA, *Submission 22*, p. 12.
76 Ms Carla Wilshire OAM, Director, Centre for Digital Wellbeing (CDW), *Committee Hansard*, 4 October 2023, p. 8.
77 ACSSO, *Submission 25*, p. 8; Ms Wilshire, CDW, *Committee Hansard*, 4 October 2023, p. 8.
78 ISA, *Submission 22*, p. 12.
79 Australian Curriculum, Assessment and Reporting Authority (ACARA), *Submission 16*, pp. 3–4.
80 ACARA, *Submission 16*, p. 2.

delivery, including 'guidance given to people around the kinds of tools and processes they might use'.[81]

2.32 ACARA stated that AI and other emerging technologies are accounted for in the recently revised Australian Curriculum. ACARA stated that learning about AI and other emerging technologies are covered by the Foundation to Year 10 Australian Curriculum,[82] which covers how AI works, types of AI (digital tools and AI systems), and responsible use and applications of AI.[83] The Australian Curriculum covers fundamental knowledge and skills regarding AI through explicit content in the mathematics and technologies learning areas. It also connects to cross-curriculum priorities and other areas like science and humanities, and can be captured by teaching general capabilities, such as digital literacy, ethics understanding, and critical and creative thinking.[84]

2.33 The Commonwealth DoE believed the Australian Curriculum sufficiently covered digital technologies,[85] whereas other stakeholders called for further updates to the Australian Curriculum. For instance, the Australian Academy of Technology Sciences and Engineering (ATSE) stated that 'current content on programming and coding within the Australian Curriculum, needs to be supplemented with specific AI education'.[86] Noting that the Australian Curriculum has been recently revised and reflects AI, there can be further updates in the next revision.

2.34 At the HE level, TEQSA is responsible for developing standards. It is argued that standards will need to consider, amongst other things, the possible impacts of AI on learning outcomes.[87] Some stakeholders argued for building AI literacy in the tertiary curricula.[88] The Australian Academy of Science argued for the integration of GenAI in HE, stating that:

> AI literacy must be promoted to the specific curricula and be embedded and scaffolded across all user degree programs so that students can progressively advance and develop these capabilities together with the other core skills.[89]

81 Ms Birmingham, DoE, *Committee Hansard*, 6 March 2024, p. 4.
82 ACARA, *Submission 16*, pp.1–3.
83 'Understand this Curriculum connection: Artificial Intelligence (AI)', *Australian Curriculum*, viewed 13 August 2024.
84 ACARA, *Submission 16*, p. 2.
85 Ms Birmingham, DoE, *Committee Hansard*, 6 March 2024, p. 4.
86 ATSE, *Submission 14*, p. 2.
87 National Tertiary Education Union (NTEU), *Submission 52*, p. 8.
88 AATSE, *Submission 14*, p. 2.
89 Professor Philip Poronnik, Chair, National Committee for Biomedical Sciences, Australian Academy of Science, *Committee Hansard*, 2 November 2023, p. 6.

2.35 Similarly, ATSE stated:

> Higher education providers, similarly, need to integrate AI skills and competencies across all courses as a core component of the curriculum. Crucially, the curriculum needs to reflect the rapid future development of AI tools and equip students with the skills they need to respond flexibly as these tools continue to develop...[90]

2.36 Some HE courses will quickly become outdated and will need redesigning, requiring 'the development of more agile systems of governance that are capable of being more responsive to changing context while upholding the integrity of the qualification'.[91] Educators will need to continue to be instrumental in designing and regularly reviewing content, adapting content that GenAI produces, and providing quality assurance.[92] The design process needs to factor in ethical and responsible uses of GenAI tools by students.[93]

Managing the use of GenAI

2.37 As discussed, GenAI tools are being used across the education system in Australia, and in other countries, and being integrated into curricula through frameworks and polices. Stakeholders called for rules and guardrails to help manage the rollout of this technology, and noted the particular vulnerabilities of minors. Australia is developing its own approach, and is looking at other key jurisdictions.

Australia's approach to safe and responsible AI

2.38 Following extensive consultation, the Department of Industry, Science and Resources (DISR) released Australia's *AI Ethics Principles* in 2019.[94] These voluntary principles are designed to ensure that AI is safe, secure and reliable. They principles are used by educational institutions, such as the Group of Eight (Go8) universities.[95] The *Australian Framework for Generative AI in Schools* was designed to align with these principles.

2.39 DISR advised that it is considering what safe and responsible AI means from a regulatory perspective.[96] Last year, under Minister Husic, DISR released a *Supporting responsible AI: Discussion paper* (the discussion paper).[97] The discussion paper explored whether Australia's regulatory system was fit for purpose to deal with

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90 AATSE, *Submission 14*, p. 3.
91 TEQSA, *Submission 33*, p. 4.
92 University of Southern Queensland, *Submission 6*, p. 1.
93 Ms Merryn Cagney, Co-manager, Law and Ethics Committee, Monash DeepNeuron, *Committee Hansard*, 9 November 2023, p. 24; TEQSA, *Submission 33*, p. 4.
94 Department of Industry, Science and Resources (DISR), *Australia's AI Ethics Principles*, 7 November 2019, viewed 13 August 2024.
95 Go8, *Submission 63*, p. 2.
96 Mr Lucas Rutherford, General Manager, AI Governance Branch, Department of Industry, Science and Resources (DISR), *Committee Hansard*, 6 March 2024, p. 11.
97 DISR, *Australia's AI Ethics Principles*, viewed 13 August 2024.

new AI technologies, including GenAI, and took a system-wide approach rather than a sector-specific one.[98]

2.40 The paper outlines the following themes:

- Opportunities and challenges: the safe and responsible deployment and adoption of AI will allow Australia to improve economic and social outcomes. However, there are significant risks, such as bias and misleading outputs.
- Domestic and international landscape: Australia can be a leader in AI, and can pursue this by continuing to engage bilaterally, regionally, and multilaterally. The paper outlines key partners' policies on GenAI.
- Managing potential risks of AI: various options for consideration by the Australian Government include regulation, industry self-regulation, collaboration and engagement, technical standards, assurance frameworks and bans.[99]

2.41 Australia does not have any AI-specific legislation.[100] DISR flagged that several incentive structures exist to promote safe products entering the market, such as those provided for in consumer laws. Another example of an incentive structure is if an AI product has 'some sort of limited adverse impact, there may be redress available under Australia's existing suite of technology neutral laws'.[101]

2.42 In response to its discussion paper, DISR received over 500 submissions, and heard from 345 virtual town hall attendees and over 200 roundtable attendees.[102] In January 2024, the *Australian Government Interim Response* (Interim Response) was released, and stated that:

- While AI will expand Australia's economy, there is low public trust that AI systems are being designed, developed, deployed, and used safely and responsibly.
- Many AI applications do not pose an inherent risk that would require a regulatory response, and low-risk AI should continue to flourish unimpeded.
- Only 33% of Australians agree that Australia has adequate guardrails for AI. There is broad consensus that voluntary guardrails are insufficient. Mandatory guardrails should apply to high-risk applications of GenAI.
- The regulatory framework does not sufficiently address the risks presented by AI. Existing laws do not adequately prevent AI-facilitated harms before they occur.
- The government needs to work closely with international partners to establish safety mechanisms and testing for models developed overseas that will be built into Australian applications.[103]

98 Mr Rutherford, DISR, *Committee Hansard*, 6 March 2024, p. 7.
99 DISR, *Australia's AI Ethics Principles*, viewed 13 August 2024.
100 A Lundie, 'Uncovering the Future of AI Regulation: The Australian Privacy Act Review', *Herbert Smith Freehills*, 20 April 2023, viewed 13 August 2024.
101 Mr Rutherford, DISR, *Committee Hansard*, 6 March 2024, p. 10.
102 DISR, *Australia's AI Ethics Principles*, viewed 13 August 2024.
103 DISR, *Australia's AI Ethics Principles*, viewed 13 August 2024.

2.43 The Interim Response committed Australia to take a risk-based approach to AI, and to avoid unnecessary or disproportionate burdens for businesses, the community, and regulators. The Interim Response called for consistency with the *Bletchley Declaration* on the opportunities and risks posed by AI, and a human-centric approach to regulation.

2.44 The Interim Response proposed the following measures to ensure responsible AI implementation:

- ongoing auditing and performance monitoring of AI systems to further guardrails
- define 'high-risk' AI in the Australian context
- develop AI Safety Standard and implement risk-based guardrails for the industry and consider watermarking or similar data provenance mechanisms
- establish an interim expert advisory group to support AI guardrails
- reform Australia's privacy laws
- work with other Government agencies to address issues raised during consultation.[104]

2.45 The Australian Government has committed to exploring 'the case for mandating guardrails for the design, development and deployment of AI in high-risk settings'. DISR is consulting across government on these guardrails, including with the Commonwealth DoE.[105] Minister Husic has since stood up an expert advisory group. The expert advisory group will advise on immediate work on transparency, testing, and accountability, including options for AI guardrails in high-risk settings to ensure that AI systems are safe.[106]

2.46 As DISR noted, the 'high-risk' approach aligns with that taken in the European Union (EU) legislation.[107] Australia, like many countries, is looking at the EU Artificial Intelligence Act (EU AI Act) is the most comprehensive regulatory framework on AI systems. DISR contends that whether that Act provides the gold standard depends on how it is implemented, and that:

> … should Australia—and governments are still consulting on this and thinking about this—go down the path of creating mandatory guardrails in this space, one of the considerations will be whether, if an organisation or a product has gone through a similar level of due diligence… that should be recognised in Australia.[108]

2.47 DISR pointed out that while the department's work is not sector-specific and does not have a particular focus on education, there are intersections with the Committee's

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104 DISR, *Australia's AI Ethics Principles*, viewed 13 August 2024.
105 Mr Rutherford, DISR, *Committee Hansard*, 6 March 2024, p. 7.
106 The Hon Ed Husic MP, Minister for Industry and Science, *New artificial intelligence expert group*, Media Release, 14 February 2024, viewed 13 August 2024.
107 Mr Rutherford, DISR, *Committee Hansard*, 6 March 2024, p. 7.
108 Mr Rutherford, DISR, *Committee Hansard*, 6 March 2024, p. 10.

inquiry. A key theme is the need to balance the opportunities and risks associated with AI. DISR highlighted that:

> The considerations have largely been focused on what government might consider or conceptualise as high risk—which could include certain applications in the context of education—and what sort of predeployment guardrails, such as testing, risk assessments, accountability measures, reporting, transparency requirements, might apply. Also under consideration are what regulatory mechanisms are available to government…. there has obviously been some consideration of education, given that has come up in consultations.[109]

Other considerations

2.48 There is a current lack of regulation for foundation models, which affects the broader digital supply chain and the safe use and management of GenAI. KomplyAi asserted that new regulation will be required, and potentially an Act of Parliament to govern AI.[110] Kristen Migliorini, founder and Chief Executive Officer of KomplyAi, stated that:

> Legislation is appearing in jurisdictions around the world. I think regulation in AI is super complex. Some have introduced regulations, but, in my view, flexibility is one of the keys. AI is borderless and rapidly evolving, so Australia has a unique challenge due its place near the end of a supply chain, in many respects.[111]

2.49 KomplyAi highlighted the following areas for potential regulation based on current overseas policies:

- consideration of certain prohibited AI activities
- exemptions for internal research and development without prejudice to commercialisation
- treatment of open source software
- and risk classifications for intersecting educational activities and AI, such as higher risk requirements for use of this AI in admissions and academic assessment.[112]

2.50 Tech for Social Good (TFSG) noted that there may be a 'governance and regulatory vacuum' as any regulatory response may lag behind the deployment of the technology.[113] The organisation emphasised the importance of establishing strong partnerships between regulators, vendors, schools, and government agencies to 'create productive environments for consensus-building and codesign'. This collaboration, including with philanthropic organisations, can 'bring GenAI

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109 Mr Rutherford, DISR, *Committee Hansard*, 6 March 2024, pp. 7–8.
110 KomplyAi, *Submission 56*, p. 4.
111 Mrs Kristen Migliorini, Founder and CEO, KomplyAi, *Committee Hansard*, 29 January 2024, p. 19.
112 KomplyAi, *Submission 56*, p. 5.
113 Tech for Social Good (TFSG), *Submission 32*, p. 10.

technologies that are safe and secure to classrooms in a way that maximises their potential as an educative tool'.[114]

2.51 Stakeholders put forward various regulatory approaches to the Committee.

- Safe AI: PLC contended that government should take a 'safety first' approach to GenAI: 'if it's not safe, it shouldn't be used'.[115]
- Soft law: TFSG suggested that the government consider soft law approaches to regulation including industry codes, standards, model governance frameworks and official guidelines. TFSG asserted that these mechanisms can 'provide bridging guidance between broad regulatory obligations and the specific context, allowing them to be tailored so they remain fit-for-purpose in the education sector'.[116]
- Introducing regulation: The National Tertiary Education Union supported the development of regulatory guardrails and implementation of good practice principles that are rooted in ethical frameworks including equity, accessibility and inclusion, prevention of bias and discrimination, and transparency and accountability.[117] On the other hand, TFSG asserted that new regulatory models can be introduced to fill gaps in existing laws where soft law is insufficient.[118] TFSG asserted '[t]here should be a focus on the immediate gaps in knowledge, skills, and understanding to mitigate risks and encourage best practices in the short term'.[119]
- Using existing laws: The Tech Council of Australia contended that the best way to regulate GenAI is to build upon and clarify existing laws and participating in international standard-setting processes. This mitigates issues with a one-size-fits-all approach.[120]
- International norms: The Tech Council of Australia also recommended that Australia takes an approach that is consistent with international norms and standards, especially from an economic perspective. If Australia creates a bespoke model that does not align with international norms, it may create barriers to investment and the deployment of GenAI technology.[121]

Privacy and copyright reform

2.52 The Attorney General's Department (AGD) is leading on privacy reforms that include considerations. Following the review of the *Privacy Act 1988* (Cth), the Attorney-General released the *Privacy Act Review Report* (Review Report)

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114 TFSG, *Submission 32*, p. 12.
115 Mr England, PLC, *Committee Hansard*, 29 January 2024, p. 2.
116 TFSG, *Submission 32*, p. 12.
117 NTEU, *Submission 52*, p. 9.
118 TFSG, *Submission 32*, p. 13.
119 TFSG, *Submission 32*, p. 10.
120 Mr Ryan Black, Head of Policy and Research, Tech Council of Australia, *Committee Hansard*, 11 October 2023, p. 3.
121 Mr Black, Tech Council of Australia, *Committee Hansard*, 11 October 2023, p. 3.

on 16 February 2023.[122] If the proposed legislative changes identified in the Review Report are adopted, they could have significant consequences for operators and users of AI.[123]

2.53 AHRC noted that the Review Report includes proposals to strengthen privacy protections regarding AI. The AHRC contended that it was 'likely that outcomes from the Review Report will directly impact privacy, security and data protection for children and certain AI tools'.[124] The Centre for Digital Wellbeing (CDW) urged the Australian Government to use the review process to create 'a robust data protection framework that outlines the rights of students in relation to personal data as well as establishing limitations to the collection, use and retention of data of minors'.[125]

2.54 AGD has also identified key issues of copyright and AI to further explore. These issues include 'the material used to train AI models, transparency of inputs and outputs, the use of AI to create imitative works, and whether and when AI-generated works should receive copyright protection'.[126]

2.55 The Australian Government stood up a Copyright and AI Reference Group (the Reference Group) in December 2023, tasked with better preparing for copyright challenges arising from AI. The Reference Group was established after the Attorney-General held a series of roundtables involving over 50 peak bodies and other organisations.

International approaches

2.56 There have been significant developments globally regarding GenAI, and in relation to education. It is important to consider international approaches and best practices when examining how Australia should manage GenAI in education. Australia can learn from multilateral, regional and country-specific efforts identified by stakeholders. This includes emerging international standards from certain jurisdictions and standards-setting bodies.[127] DISR is cognisant that interoperability between jurisdictions would aid many developers and deployers of AI systems as they operate transnationally and are subject to different regulatory schemes.[128]

Multilateral efforts

2.57 There are various multilateral initiatives that Australia supports on the management of AI. DISR and the Commonwealth DoE highlighted the *Bletchley Declaration*, which

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122 Attorney-General's Department, 'Review of the *Privacy Act 1988*', 16 February 2023, viewed 13 August 2024.

123 A Lundie, 'Uncovering the Future of AI Regulation: The Australian Privacy Act Review', viewed 13 August 2024.

124 AHRC, *Submission 65*, p. 9.

125 CDW, *Submission 83*, p. 4.

126 The Hon Mark Dreyfus KC MP, Attorney-General, 'Copyright and AI reference group to be established', *Media Release*, 5 December 2023, viewed 13 August 2024.

127 Mr Rutherford, DISR, *Committee Hansard*, 6 March 2024, p. 6.

128 Ms Wilshire, CDW, *Committee Hansard*, 4 October 2023, p. 6.

Australia signed alongside the EU and 27 countries in November 2023.[129] The *Bletchley Declaration* is about AI safety, and as Amazon Web Services (AWS) articulated, 'the need for an evidence and scientific based identification of risks relating to AI and the need for a risk and principles based approach to addressing those risks'.[130] DISR underlined the need for Australia's evolving response to AI to be consistent with the *Bletchley Declaration*.[131]

2.58 The United Nations Educational, Scientific and Cultural Organization (UNESCO) has been at the forefront of AI and education,[132] and cautioned that 'the speed at which generative AI technologies are being integrated into education systems in the absence of checks, rules or regulations, is astonishing'.[133] In 2023, it conducted a global survey of 450 schools and universities, and found that under 10% of respondents had policies or formal guidance relating to the use of GenAI.[134]

2.59 UNESCO released *AI and education: guidance for policy-makers* (2021) which suggests that 'policymakers should strategically review how AI can transform the role of teachers and how they can prepare to work in education settings…'.[135] Some other helpful policies, resources and activities of UNESCO include:

- *ChatGPT and artificial intelligence in higher education: quick start guide* (2023)
- *Recommendation on the ethics of artificial intelligence* (2022)
- *The Beijing Consensus on AI and Education* (2019).

2.60 UNESCO has also been organising international forums on the use of AI and education since 2019.[136]

2.61 Stakeholders flagged that the Organisation for Economic Co-operation and Development (OECD) has a body of relevant work. The AAIN highlighted the following OECD guidance:

- *AI language models: Technological, socio-economic and policy considerations* (2023)
- *OECD Framework for the Classification of AI systems* (2022)
- *Recommendation of the Council on Artificial Intelligence* (2019).[137]

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129 Ms Birmingham, DoE, *Committee Hansard*, 6 March 2024, pp. 1-2; DISR, *Australia's AI Ethics Principles*, viewed 13 August 2024.

130 Ms Min Livanidis, Head of Digital Trust, Cyber and Data Policy, Australia and New Zealand, Amazon Web Services, *Committee Hansard*, 29 November 2023, p. 6.

131 DISR, *Australia's AI Ethics Principles*, viewed 13 August 2024.

132 Mrs Kristen Migliorni, Founder and Chief Executive Officer, KomplyAi, *Committee Hansard*, 29 January 2024, p 20; Mrs Finlay, AHRC, *Committee Hansard*, 4 October 2023, p. 17.

133 Giannini, S, 'Generative AI and the future of education', *UNESCO*, July 2023, viewed 13 August 2024, p. 4.

134 AHRC, *Submission 65*, p. 16.

135 DoE, *Submission 48*, p. 6.

136 AHRC, *Submission 65*, p. 16.

137 Australasian Academic Integrity Network, *Submission 58*, p. 12.

2.62 The OECD highlighted that given the emerging nature of GenAI in education, there was a lack of evidence of international best practices for implementation, evaluation of outcomes, and specific lessons for Australia. It outlined some of its relevant projects and initial findings.[138] Australia is participating in the OECD's High Performing Systems for Tomorrow Phase II project, which is investigating best practice for the use of AI in secondary schools.[139] The Australian Education Union is involved with the OECD in creating policy around the use of GenAI.[140]

2.63 The United Nations Childrens Fund (UNICEF) released its *Policy guidance on AI for children* in 2021.[141] UNICEF has also created a Learning Innovation Hub that aims to improve K–12 education worldwide by using tested EdTech, investing in pilot projects, and generating evidence.[142]

European Union

2.64 As mentioned, the European Union (EU) has the most comprehensive legislation on AI in the world, and DISR and the Commonwealth DoE are following its implementation closely.[143] DISR is leading work on safe and responsible AI in Australia, and is considering the 'high-risk' focused approach taken by the EU.[144] The EU also has other relevant work. For example, the European Commission released *Ethical Guidelines on the Use of Artificial Intelligence and Data in Teaching and Learning for Educators* in October 2022, which sit within the EU's Digital Education Action Plan 2021–2027.[145] Additionally, the Council of Europe published a study on *Artificial Intelligence and Academic Integrity* in April 2023.[146]

2.65 The European Parliament approved the EU AI Act in March 2024, which will be confirmed as law upon completion of the final steps. The EU AI Act will apply to all AI systems across all sectors that impact people in the EU. This includes AI systems built and operated from within the EU or elsewhere. That is, the EU AI Act will apply to the EU's 27 Member States, as well as to entities with AI systems in the EU, such as Australian companies. It creates significant compliance obligations and financial penalties.[147]

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138 Organization of Economic Co-operation and Development, *Submission 59*, p. 1.
139 DoE, *Submission 48*, p. 9.
140 Mr Kevin Bates, Federal Secretary, Australian Education Union, *Committee Hansard*, 2 November 2023, p. 4.
141 United Nations International Children's Emergency Fund, *Policy guidance on AI for children*, November 2021, viewed 13 August 2024.
142 Claire Field, *Submission 70*, p. 21.
143 RUN, *Submission 40*, p. 4; Mr Rutherford, DISR, *Committee Hansard*, 6 March 2024, p. 8.
144 Mr Rutherford, DISR, *Committee Hansard*, 6 March 2024, p. 7.
145 TEQSA, *Submission 33*, p. 8.
146 Claire Field, *Submission 70*, p. 11.
147 EY, *The European Union Artificial Intelligence Act*, 2 February 2024, viewed 26 August 2024, p. 15.

2.66 In summary, the EU AI Act:

- Takes a risk-based approach: it has four categories of risks. It prohibits unacceptable risks (e.g. manipulative AI), regulates high-risk AI systems, has lighter obligations on limited risk AI systems (e.g. companies must ensure that end-users know they are engaging with AI chatbots and deepfakes), and does not regulate minimal risk AI systems.
- Focuses on providers (developers) and high-risk: it regulates providers that plan to place on the market or put into service high-risk AI systems in the EU, and third country providers where the high-risk AI system's output is used in the EU.
- Creates rules for users (deployers) of high-risk AI systems: it applies to users in the EU, and third country users if the AI system's output is used in the EU.
- Regulates general purpose AI (GPAI) model providers: it imposes various obligations, such as on the data used for training, copyright, and evaluations and reporting.[148]

2.67 Several stakeholders support Australia adopting a similar approach to the EU. For instance, TEQSA approved of the EU's risks-based approach and 'clear humancentric regulation of current and future AI applications'.[149] The CDW commended that the EU requires high-risk AI systems to 'undergo a rigorous process before entering the market… including impact assessments'.[150] The CDW asserted that the EU's model would help address ethical concerns and bias, and encouraged Australia to consider the EU AI Act, in particular its:

- risk-based approach
- robust data protection framework
- third party and independent impact and audit assessments
- mandatory transparency data use policies and reports
- requirements for human oversight of AI systems depending on the risk category
- accountability measures.[151]

2.68 KomplyAi encouraged Australia to draw from various jurisdictions, including the EU. It noted that the EU takes a good approach to competition and to 'foundational models and some of the big tech providers'. It suggested Australia take a risks-based approach and 'nominate the high-risk activities that we feel need to have a governance regime in place in terms of testing, certifications to market, labelling and transparency, and governance documentation…'.[152]

148 Future of Life Institute, *EU Artificial Intelligence Act – High level Summary*, 27 February 2024, viewed 13 August 2024.
149 TEQSA, *Submission 33*, p. 8.
150 CDW, *Submission 83*, p. 13.
151 CDW, *Submission 83*, pp. 4–5; Ms Wilshire, CDW, *Committee Hansard*, 4 October 2023, p. 5.
152 Mrs Migliorni, KomplyAi, *Committee Hansard*, 29 January 2024, p. 19.

2.69 Further, KomplyAi stated that DISR could consider the EU's nomination of educational activities in the Act's high-risk section. It explained that DISR could also potentially introduce some of the EU's prohibitions on illegal practices, especially those relating to children. Examples of illegal activities in the education sector could include 'AI systems that infer the emotions of natural persons in the education institution', like facial recognition, or 'AI systems that use covert or manipulative methods to greatly influence a user's decision making abilities'.[153]

2.70 Dr Curran flagged some complexities around the interpretation of these concepts:

> … education-related aspects actually straddle the dangerous, 'no, don't do it at all: dangerous' category and the high-risk category… emotion detection is in the 'not acceptable at all' category in schools, but the high-risk category includes things like high-risk testing environments that might limit your access to further education opportunities. It will be very interesting to see exactly how those get interpreted, because there are a lot of tools out there that could arguably say they're already doing some of these things and have to switch off some of these features.[154]

2.71 The Regional Universities Network welcomed the EU's focus on 'the ethical and societal implications of generative AI'. The Regional Universities Network further conveyed that while it does not support regulation specific to HE, it does support an EU model, stating:

> the need for institutions to act quickly and have flexibility in decision making regarding generative AI, and [it] would not be supportive of strict regulation specific to higher education environments. However, a broad, society-wide regulatory framework for AI such as the risk-based model proposed in the EU could help to mitigate some of the challenges and risks of the technology.[155]

United States

2.72 DISR and the Commonwealth DoE are closely monitoring regulatory developments in the United States (US), especially from an interoperability perspective.[156] The Commonwealth DoE is looking carefully at the *US Executive Order on the Safe, Secure and Trustworthy Development and Use of AI Technologies*, issued in 2023.[157] The Executive Order mainly:

- creates new standards for AI safety to protect against risks, such as by requiring powerful developers to share critical information with the government
- helps consumers and workers, including through workforce training and personalised tutoring in schools. It aims to 'shape AI's potential to transform

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153 Mrs Migliorni, KomplyAi, *Committee Hansard*, 29 January 2024, p. 19.
154 Dr Curran, Grok Academy, *Committee Hansard*, 20 March 2024, p. 1.
155 RUN, *Submission 40*, p. 5.
156 Mr Rutherford, DISR *Committee Hansard*, 6 March 2024, p. 8; Ms Birmingham, DoE, *Committee Hansard*, 6 March 2024, p. 2.
157 Ms Birmingham, DoE, *Committee Hansard*, 6 March 2024, p. 2.

education by creating resources to support educators deploying AI-enabled educational tools'

- protects nationals' privacy, with a special focus on children
- advances equity and civil rights, such as by addressing algorithmic discrimination through training, technical assistance, and coordination
- encourages innovation and competition, such as by promoting a fair, open, and competitive AI ecosystem and supporting domestic research
- advances the country's global leadership, such as by engaging bilaterally and multilaterally and hastening standards development and implementation.[158]

2.73 The US Government introduced the *AI Risk Management Framework* in 2023,[159] and released an accompanying publication in 2024 to help organisations identify and manage GenAI risks.[160] In 2023, it announced the establishment of seven AI centres, with two focussed on education.[161] The US Government also released a report in 2023 on *Artificial Intelligence and the Future of Teaching and Learning: Insights and Recommendations*. The report creates guidelines for the ethical use of AI in education.[162] ACSSO explained that:

> These guidelines emphasise the importance of transparency, accountability, and privacy protection. They recommend that schools and educational institutions develop clear policies and procedures for using AI tools, including informed consent from students and families and regular audits to ensure compliance.[163]

United Kingdom

2.74 The first bilateral agreement for evaluating the safety of AI tools and systems was signed by the US and United Kingdom (UK) in April 2024, which builds on the *Bletchley Declaration*. The UK Secretary of State for Science, Innovation and Technology, Michelle Donelan, asserted that it was 'the defining technology challenge of our generation'. A British Broadcasting Corporation article stated that the AI tech giants, which are mainly US-based, 'are still cooperating with the concept of regulation, but regulators have yet to curtail anything these companies are trying to achieve'. There is an unwillingness among AI tech giants to share information about the data they use to train their AI tools.[164]

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158 The White House, *FACT SHEET: President Biden Issues Executive Order on Safe, Secure, and Trustworthy Artificial Intelligence*, 30 October 2023, viewed 13 August 2024.

159 University of South Australia, *Submission 29*, p. 9.

160 National Institute of Standards and Technology, *AI Risk Management Framework*, viewed 13 August 2024.

161 Professor Shazia Sadiq, Fellow, Australian Academy of Technological Sciences and Engineering, *Committee Hansard*, 5 February 2024, p. 15.

162 University of Technology Sydney, Centre for Research on Education in a Digital Society (UTS CREDS), *Submission 19*, p. 1; Claire Field, *Submission 70,* p. 11.

163 ACSSO, *Submission 25,* p. 7.

164 L McMahon and Z Kleinman, 'AI Safety: UK and US sign landmark agreement', *BBC*, 2 April 2024, viewed 13 August 2024.

2.75 The UK has many other initiatives regarding AI including:

- its Department for Education released a *Departmental Statement on generative artificial intelligence in education* in March 2023. It then put out a 'call for evidence' from educators and experts about risks and opportunities of GenAI[165]
- creating a coordination and expert advisory model to assist regulators to understand the technology and how to enforce regulations and promote compliance by companies[166]
- a Centre for Data Ethics and Innovation that considers the effects of AI on various sectors, including the education sector[167]
- the Russell Group of universities, like Australia's Go8, released principles on the use of AI in education in July 2023.[168]

2.76 The UK has taken a collaborative approach of utilising working groups and communities of practice. For instance, Jisc is a long-established not-for-profit organisation that focuses on digital, data and technology issues regarding HE, research and innovation.[169] Jisc provides guidance to universities, instead of each institution needing to work out their own approaches. Griffith University stated it 'is the bare minimum of what we should be doing'.[170] EdTech UK has hubs across the UK; builds communities of practice of educators, businesses, researchers; and advocates and provides advice to help close digital gaps, including in AI.[171]

Canada

2.77 DISR and the Commonwealth DoE are observing Canada's recent significant legislative developments.[172] Currently, Canada also lacks a regulatory framework specific to AI, however, it has proposed the *Artificial Intelligence and Data Act* (AI and Data Act), which was introduced as part of Bill C-27, *Digital Charter Implementation Act, 2022*.[173] The proposed AI and Data Act was one of the first proposed national regulatory frameworks on AI, and is yet to come into effect. In the interim, Canada has provided the *Voluntary Code of Conduct on the Responsible Development and Management of Advanced Generative AI Systems* to give Canadian companies common standards.[174]

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165 UTS CREDS, *Submission 19*, p. 1; Claire Field, *Submission 70,* p. 11.
166 Mr Black, Tech Council of Australia, *Committee Hansard*, 11 October 2023, p. 3.
167 ISA, *Submission 22*, p. 12.
168 Claire Field, *Submission 70*, p. 11.
169 'About us', *Jisc*, viewed 13 August 2024.
170 Professor Elizabeth Burd, Provost, Griffith University, *Committee Hansard*, 5 February 2024, p. 11.
171 Dr Teresa Swist, Co-lead, Education Futures Studio, The University of Sydney, *Committee Hansard*,3 30 January 2024, p. 18.
172 Mr Rutherford, DISR, *Committee Hansard*, 6 March 2024, p. 8; Ms Birmingham, DoE, *Committee Hansard*, 6 March 2024. pp. 1–2.
173 The Australian Academy of Humanities (AAH), *Submission 45*, pp. 2–3.
174 Government of Canada, Artificial Intelligence and Data Act, 27 September 2023, viewed 13 August 2024.

2.78 Regarding the proposed AI and Data Act, the Canadian Government said:

> It is designed to protect individuals and communities from the adverse impacts associated with high impact AI systems, and to support the responsible development and adoption of AI across the Canadian economy. It aligns with the EU's… AI Act by taking a risk-based approach and would be supported by industry standards developed over the coming years.[175]

2.79 The proposed AI and Data Act would align with the EU's approach to create interoperability and consistency with international best practices. As the AI and Data Act's list of high-impact systems is proposed to be subject to amendment, AI systems in education deemed to be high-impact could be captured in future.[176] Given 'the previous iteration of AIDA basically miss..[ed] the rise of generative AI entirely', some proposed changes to the AI and Data Act establish distinct yet similar requirements for AI chat systems that are based on LLMs.[177] Canada has proposed a new regulator, the AI and Data Commissioner, who would have some responsibilities around education and upskilling.[178]

2.80 Some stakeholders commended various aspects of the proposed AI and Data Act. DISR stated that the risk-assessment pre-deployments tests in the AI and Data Act, as well as the EU AI Act, function as useful guardrails. DISR noted that these Acts focus on "built-in discrimination based on either the data that's chosen or the people that have designed or developed that AI model".[179] KomplyAi also commented that the proposed AI and Data Act helpfully:

> … looks at the effect and the impact of technology rather than regulating every widget and gadget. So you start to identify a risk profile of the activity type, the novel characteristics of the AI, the scale of impact, the type of harm, if you're engaging with more vulnerable people and the type of data that you're using.[180]

China

2.81 China aims to be a global leader in AI in the next seven years and is very active in managing GenAI.[181] Professor Davis advised the Committee that China has a GenAI draft law under discussion, which will soon be implemented. It is quite comprehensive, takes a rules-based (not a risk-based) approach, and sets key standards.[182]

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175 Government of Canada, The Artificial Intelligence and Data Act (AIDA) – Companion document, 13 June 2023, viewed 13 August 2024.

176 K Bennett, et al, 'AI regulation in Canada – What's happening now?', *DLA Piper*, viewed 13 August 2024.

177 AAH, *Submission 45*, pp. 2–3; Bennett, K, et al, 'AI regulation in Canada – What's happening now?', *DLA Piper*, viewed 13 August 2024.

178 AAH, *Submission 45*, pp. 2–3.

179 Mr Rutherford, DISR, *Committee Hansard,* 6 March 2024, p. 8.

180 Mrs Migliorni, KomplyAi, *Committee Hansard*, 29 January 2024, p. 19.

181 Ms Vicki Thomson, Chief Executive, Group of Eight Universities, *Committee Hansard*, 20 September 2023, p. 1.

182 Professor Davis, UTS, *Committee Hansard*, 6 September 2023, p. 8.

Committee comment

2.82 Since this inquiry began, there have been significant domestic and international developments in practices and policies regarding GenAI in the education system. The Committee commends the work underway by relevant Australian Government departments, including the Commonwealth DoE, DISR, and AGD, and regulators like TEQSA, ACECQA, and the eSafety Commissioner.

2.83 The Committee recommends that GenAI in education be made a national priority. The Committee supports the use of GenAI tools in the Australian education system given the opportunities presented, although it recognises the significant challenges involved and need for guardrails. It is imperative that Australia forges ahead to safely and ethically maximise the benefits while mitigating the risks of GenAI in the education system.

2.84 The Committee supports equity of access for all students and educators to high-quality and suitable GenAI products. The Committee considers that the best way to implement GenAI education tools into the school system is by creating and implementing guidelines and polices like the *Australian Framework for Generative AI in Schools*, setting product standards like ESA, and integrating it into the curriculum.

2.85 The Committee notes that the Australian Curriculum has recently been revised and supports further revision to remain fit-for-purpose. The Committee encourages the Australian Government to further integrate personalised education GenAI tools, like study buddies, into the school curriculum and practice. The Committee recognises TEQSA's work in promoting greater consistency in standards for GenAI in HE.

2.86 Many students and staff in Australian schools, TAFEs, and universities are already experimenting with GenAI. In response to the proliferation of GenAI tools and their uptake, many stakeholders are calling for government-led collaboration to help people engage with the technology safely, responsibly, and ethically. The Committee anticipates an increase in the uptake of GenAI tools in schools nationally, following the release of the *Australian Framework for Generative AI in Schools*. The Australian Government can assist in various ways with the implementation of this framework, for instance through working with key partners to provide training and setting up support hubs.

2.87 The Committee considered the suitability of GenAI tools for different ages of students. The Committee recognises the additional vulnerabilities surrounding children and the use of AI, such as issues around privacy and exploitation. The Committee believes that children in ECEC should not be exposed to GenAI until a framework is developed or the NQF is updated, and recognises that staff could use the technology to reduce administrative burdens. The Committee supports the foundational concepts and ethics of GenAI being introduced in primary school, and generally accepts students' use of certain GenAI education-specific tools under supervision.

2.88 Some educational providers and educators are seeking assistance in the selection of GenAI tools to use or with the provision of tools. The Committee notes ESA's work in setting product expectations to assist schools in selecting GenAI tools and underlines the need to not select tools that store data offshore or sell data to third parties. Government procurement for schools should be designed to include requirements and standards that ensure that the product both responds to possible significant risks and is based on evidence about what constitutes a high-quality educational product.

2.89 To make GenAI education tools fit-for-purpose in Australian schools, foundation models should be trained on data that is based on the Australian Curriculum. This can help make the tools relevant and local to Australia, as well as inclusive, like being sensitive to gender and culture. Such efforts can promote the benefits of the technology being realised, can mitigate some risks presented by GenAI, encourage equity of access to a high-quality GenAI tool, and serve Australia's economic and future workforce interests.

2.90 The Committee heard a range of views about who should provide and pay for GenAI tools for use in the education system, and which products to use. Individual students and educators can access free GenAI products, or pay for premium versions, but they are generally not education-specific products. Some States and schools are already running pilot programs to incorporate GenAI education tools into schools. This can feed into an evidence base about what works and the impacts. TAFEs and universities should obtain licences to quality GenAI products for their staff and students to use.

2.91 There is an urgent need to create, implement, and enforce mandatory and voluntary guardrails. The Committee supports a coordinated and proactive approach, especially between Commonwealth, State and Territory governments, regulators, industry, educational institutions, educators, and international partners.

2.92 Stakeholders have opposing views on possible regulatory options. Some considerations include whether the Australian Government should legislate on matters relating to GenAI in education, whether there should be a system-wide or sector-specific approach, and whether obligations should fall on educational institutions and EdTech companies. Universities were vocal in maintaining some flexibility and not being strictly regulated, but some called for consistent standards.

2.93 The Committee recognises that DISR is leading exploratory work on regulatory approaches for safe AI. The Committee supports this work and encourages the Australian Government to consider all of the proposed measures in its Interim Response and specifically in regard to the Australian education system.

2.94 The Committee notes that the Australian Government is committed to taking a risks-based approach to safe AI, and that DISR is considering what constitutes high-risk AI systems in an Australian context. The EU AI Act is the most comprehensive regulatory model in the world and offers guidance to Australian policymakers. In line with the EU legislation, the Committee agrees with stakeholders and recommends that the Australian Government regulate high-risk AI systems and unacceptable risks in the Australian education system, especially given the vulnerability of minors.

2.95 There is general support for the Australian Government to draw from international regulatory approaches, such as Canada and the US. This is important from a pragmatic interoperability perspective to promote harmonisation between regulatory systems given the technology applies transnationally.

Recommendation 1

2.96 The Committee recommends that the Australian Government:

- **consider making the use of GenAI in education a national priority**
- **create safeguards for all users, especially minors**
- **maximise the opportunities of GenAI education-specific tools and integrate such tools into the school curriculum and practice.**

Recommendation 2

2.97 The Committee recommends that the Australian Government work with State and Territory Governments to ensure that all Australian schools are funded to 100 per cent of the Schooling Resourcing Standard.

2.98 This could support access to high-quality educational GenAI tools by students and educators, especially in marginalised communities.

Recommendation 3

2.99 The Committee recommends that the Australian Government in conjunction with the States and Territories:

- **monitor current pilot programs and evaluate the different approaches to using GenAI education tools in schools, including as a study buddy**
- **build high-quality GenAI education products with datasets based on curriculum, and that meet ESA's product standards, based on the learning outcomes of current pilot programs.**

2.100 The evaluation should include consultations with State and Territory Governments to implement GenAI pilot projects about lessons learned, and how to best design the procurement process.

Recommendation 4

2.101 The Committee recommends that the Australian Government work with key partners to promote GenAI tools that are fit for purpose, meaning they are:

- **quality education products in terms of the design and alignment with educational outcomes**
- **featuring a higher-quality filter to restrict the data used to train an LLM**
- **trained on datasets based on the Australian Curriculum, so inputs are:**
  - **local—reflecting the Australian context, including the curriculum and Indigenous knowledge**
  - **inclusive—for example, gender and disability inclusive.**

Recommendation 5

2.102 The Committee recommends that the Australian Government provide more support to implement the *Australian Framework for Generative AI in Schools*, including to:

- **expediate the taskforce's creation of an implementation plan for the framework and ESA's product setting work**
- **provide funding to set up virtual and physical hubs to provide expert and technical advice and support to institutions**
- **in conjunction with others—provide GenAI literacy and training, to leaders, teachers, support staff, students, parents and guardians, and policy makers**
- **make certain guiding statements in the framework that general educators are not qualified to implement, apply instead to technical staff.**

Recommendation 6

2.103 The Committee recommends that the Australian Government encourage consistent guidance and uptake of GenAI:

- **in school—education, by working with ACARA to integrate AI literacy across all subjects in the next curriculum review cycle—and to update it regularly to reflect the rapid technological developments, knowledge and skills required**
- **in HE—including updating the threshold standards, and recognises TEQSA's leadership role and efforts.**

Recommendation 7

2.104 The Committee recommends that the Australian Government:

- **allow the use of GenAI by educators and staff in ECEC for certain purposes, such as reducing administrative burden, and defer the use of GenAI by children in ECEC until a framework is developed or the NQF is updated**
- **allow students in primary school to have access to bespoke GenAI tools but restrict certain features and build in more safeguards to make those tools age appropriate, noting that primary school students should not have access to certain GenAI products like ChatGPT, which have minimum age requirements.**

Recommendation 8

2.105 The Committee recommends that the Australian Government promote safeguards by working with:

- **the eSafety Commissioner, and resourcing the Commissioner to support education providers by giving further guidance on how to use GenAI ethically, safely, and responsibly in educational settings**
- **State and Territory education departments to develop and implement ethical, safe, and responsible AI practices, and voluntary and mandatory guardrails**
- **education providers and the EdTech industry to safely integrate GenAI into Australian schools, universities, and TAFEs, with appropriate internal and external support and safeguards, to:**
    - **realise the benefits of GenAI to educators, other staff, researchers, and students, and to Australia broadly**
    - **actively mitigate risks, including the potential for misuse.**

Recommendation 9

2.106 The Committee recommends that the Australian Government, utilising DISR's expert advisory group:

- **identify unacceptable risks in the education sector, including making the use of GenAI to detect emotion be under an unacceptable risk category for use in schools, like the EU's approach**
- **explicitly consider the design, development, and deployment of AI systems that could be categorised as high-risk in the education sector**
- **have specific regard to the vulnerability of children**
- **identify pre-deployment guardrails for GenAI products for use in the Australian education system.**

Recommendation 10

2.107 The Committee recommends that the Australian Government work closely with key international partners:

- **including the EU, Canada, and US, to promote interoperability regarding requirements and guardrails for GenAI products**
- **including non-governmental stakeholders, to share best practice, identify opportunities, and bolster the evidence base of the impacts of GenAI in education.**

3. Risks and responses

3.1 The emergence of generative artificial intelligence (GenAI) as an educational tool has brought safety, wellbeing, and other concerns, with it. The inherent challenges presented by GenAI affect all users, including students and educators. It is essential to be aware of risks pertaining to the technology itself, its use, and the data, in order to manage them.

3.2 Some of these challenges, which are all linked to safety, wellbeing, and security in various ways, include:

- online safety and adverse impacts on personal development
- overreliance on GenAI
- mis- and disinformation
- algorithmic bias and data-driven profiling
- data capturing practices by educational technology (EdTech) companies
- transparency, and the commercial interests of EdTech companies
- data security, privacy and copyright.

3.3 Many of these risks stand to disproportionately impact vulnerable groups, including children, Aboriginal and Torres Strait Islander students, female students, and students from culturally and linguistically diverse populations.[1] Female students as well as students from culturally and linguistically diverse populations may be particularly affected due to being mispresented.[2]

Context of safety and wellbeing

3.4 The Committee heard that people commonly do not feel safe when using artificial intelligence (AI). According to KomplyAi, on average, Australians distrust GenAI technology more than people in most countries.[3] Professor Nicholas Davis, Industry Professor of Emerging Technology and Co-Director of the Human Technology Institute at the University of Technology Sydney (UTS), also commented that:

1 Centre for Digital Wellbeing (CDW), *Submission 83*, p. 8; Federation of Parents and Citizens Associations of NSW (FPCA NSW), *Submission 43*, p. 5.
2 School of Education, La Trobe University, *Submission 91*, p. 8.
3 Mrs Kristen Migliorini, Founder and Chief Executive Officer, KomplyAi, *Committee Hansard*, 29 January 2024, p. 19.

> …in terms of where we are today, from my discussions with teachers, schools, parents and others, as much anecdotally or more anecdotally than anything that is purely systematic, we're in a place where people are more scared and more confused than they were, rather than having deeper levels of clarity and understanding.[4]

3.5 Looking at the broader context, the Australian Government has been active in rolling out reforms regarding human safety and wellbeing with respect to technology. The *Online Safety Act 2021* (Cth) (OSA) gives the eSafety Commissioner a suite of regulatory powers to protect Australians from online harm. The eSafety Commissioner claims that under the OSA they can remove abusive and harmful content, take enforcement action against those who fail to comply, and develop industry codes that cover the eight sections of the online industry.[5] The OSA is under review by the Department of Infrastructure, Transport, Regional Development, Communications and the Arts with a report due to the Minister for Communications by 31 October 2024.[6]

3.6 Further, in June 2024, the Criminal Code Amendment (Deepfake Sexual Material) Bill 2024 was tabled 'to strengthen laws targeting the creation and non-consensual dissemination of sexually explicit material online, including material created or altered using generative AI, including deepfakes'.[7]

3.7 The eSafety Commission expressed concerned about the potential for GenAI to amplify cyberbullying and cyber abuse. This is due to GenAI's 'capability to produce 'human-like' interaction combined with novel high quality personalised content'. Although certain GenAI products have minimum age requirements to use them, generally 13 or 18 years of age, companies like OpenAI are unlikely to adequately protect minors who use them regardless. This is underpinned by their assertion that they receive reports about cyberbullying from children as young as eight on social media platforms despite their minimum age requirements.[8]

3.8 Mobile phones have been banned in all Australian public schools as the Australian Government hopes it will improve student, as well as teacher, wellbeing, and reduce cyberbullying.[9] The Independent Education Union of Australia (IEUA) stated that the manipulation and setting up of Facebook sites and pages to bully students and teachers is a pervasive issue, but that schools should have policies in place to manage social media bullying. The IEUA cites the removal of mobile phones in school as a means to address this.[10] However, the Queensland University of

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4 Professor Nicholas Davis, Industry Professor of Emerging Technology and Co-Director of Human Technology Institute, University of Technology Sydney (UTS), *Committee Hansard*, 20 March 2024, p. 3

5 eSafety Commissioner, *Submission 84*, pp. 10–11.

6 Department of Infrastructure, Transport, Regional Development, Communications and the Arts, *Statutory Review of the Online Safety Act 2021*, April 2024, viewed 30 July 2024.

7 'Australian Government targets sexually explicit deepfakes', *Gilbert and Tobin*, 26 June 2024, viewed 31 July 2024.

8 eSafety Commission, *Submission 84*, pp. 5–6.

9 Campbell, M and Edwards, E, 'We looked at all the recent evidence on mobile phone bans in schools – this is what we found', *The Conversation*, 12 March 2024, viewed 30 July 2024.

10 Ms Veronica Yewdall, Assistant Federal Secretary, IEUA, *Committee Hansard*, 11 October 2023, pp. 6–7.

Technology raises concerns about nation-wide bans on the use of mobile phones in schools; citing equity concerns for students experiencing disadvantage.[11]

3.9 An emerging concern is the introduction of facial recognition technology in the classroom. Kristen Migliorini, Founder and Chief Executive Officer of KomplyAi, claimed there is a risk of the use of facial recognition technology to monitor student behaviour and concentration levels.[12] Facial recognition technology has previously been deployed in schools in Sweden to take student attendance. While this did save time, it meant that teachers were not interacting with students as a means to find out what was happening in their lives as it removed that informal structure. Deployment of facial recognition technology was done to alleviate teacher workload, but was banned by a Swedish court over data protection concerns.[13]

Chatbots

3.10 GenAI driven chatbots give rise to various safety and wellbeing concerns for students. There are risks that GenAI could be trained on adult and inappropriate content that is incorporated into datasets that can generate content.[14] Independent Schools Australia asserted that GenAI tools have the potential to produce highly realistic content such as text, images, or videos that may affect the emotional or psychological wellbeing of students and influence their mental health or emotional stability.[15] Chatbots may have age-inappropriate conversations or display content that is sexual or violent to children. For example, the Australian Science and Mathematics School found one incident of an image based GenAI tool being able to generate sexualised content.[16]

3.11 GenAI chatbots come across as having a 'high level of authority, expertise, and competency'.[17] The Centre for Digital Wellbeing (CDW) raised concerns about the level of oversight in the relationship between a chatbot and child, which could be 'destructive to that child's mental health and wellbeing'.[18] This is because the user may not be able to discern the limits of knowledge of the application, and the dataset that underpins the chatbot, and this may disproportionately affect children and young people.[19]

3.12 GenAI chatbots may present with 'human-like' qualities to children, including mimicking common conversational traits that imply a personal or trusted relationship

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11 Queensland University of Technology, *Submission 57*, p.5.
12 Mrs Migliorini, KomplyAi, *Committee Hansard*, 29 January 2024, p. 19.
13 Professor Kalvervo Gulson, Education Futures Studio, The University of Sydney Policy Lab, *Committee Hansard*, 30 January 2024, p. 19.
14 Australian Science and Mathematics School (ASMS), *Submission 31*, p. 3.
15 Independent Schools Australia (ISA), *Submission 22,* p. 10.
16 ASMS, *Submission 31*, p. 3.
17 eSafety Commission, *Submission 84*, p. 4.
18 Ms Carla Wilshire OAM, Director, Centre for Digital Wellbeing (CDW), *Committee Hansard*, 4 October 2023, p. 7.
19 eSafety Commission, *Submission 84*, p. 4.

with the student.[20] Dr James Curran, Chief Executive Office of the Grok Academy, highlighted that the models are built to be conversational tools which makes detecting where they have wavered from the prompt difficult. Dr Curran further explained that it is important to remember that a user is having a conversation with a system that trained on the entirety of the internet, and a system that is skilled at predicting what the next most useful word will be.[21] There are further concerns about the ethical development of GenAI and how a chatbot directly engages with children when it uses biased data scraped from the internet.[22]

3.13 Chatbots can provide mental health and wellbeing advice, which has both advantages and disadvantages. The eSafety Commission explained that an AI chatbot can provide timely and relevant advice on mental health and wellbeing by offering referral services and reporting harm and abuse.[23] The Australian Academy of Technological Sciences & Engineering (ATSE) raised concerns about GenAI and mental health interventions:

> There is an emerging risk that generative AI tools are interacting conversationally with users around mental health and wellbeing. This leads to risks that students may be encouraged to talk to an AI system rather than a human. While for some students discussing mental health issues with an AI may make them more comfortable to seek help for mental health issues, some students may be less likely to access timely interventions, might receive poor advice, or mental ill health may even be exacerbated by such interactions.[24]

3.14 The Committee heard that chatbots may be able to report and respond to concerns for the welfare and safety of children and young people. This may include 'seeking help or making disclosures about experiences, events, or circumstances impacting their safety, health, mental health or wellbeing'.[25]

3.15 Pymble Ladies' College (PLC) stated that GenAI can be used in a socio-emotional learning context to help students in understanding and managing their emotions. PLC contended that the technology can 'track emotional progress over time and suggest techniques to manage emotions' 'provide interactive scenarios where students can practice emotional responses', and 'provide resources for self-help and coping strategies when it identifies emotional distress'.[26]

3.16 However, PLC also stated that GenAI's understanding, and interpretation of human emotion, can be limited and lead to incorrect suggestions from the technology.[27] Under the EU Artificial Intelligence Act (EU AI Act), the use of GenAI to detect emotion falls under the 'not acceptable at all' category in schools.[28]

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20 eSafety Commission, *Submission 84*, p. 4.
21 Dr James Curran, Chief Executive Officer, Grok Academy, *Committee Hansard,* 20 March 2024, p. 7.
22 Ms Wilshire, CDW, *Committee Hansard*, 4 October 2023, p. 7.
23 eSafety Commission, *Submission 84*, p. 5.
24 Australian Academy of Technology Sciences and Engineering (AATSE), *Submission 14*, p. 4.
25 eSafety Commission, *Submission 84*, pp. 4–5.
26 Pymble Ladies' College (PLC), *Submission 93*, p. 33.
27 PLC, *Submission 93*, p. 33.
28 Professor Davis, UTS, *Committee Hansard,* 20 March 2024, p. 1.

3.17 Evolved Reasoning provided a concrete example of how a GenAI tool could both help and adversely affect a child's wellbeing. It explained that a school child may be given a GenAI tool called SARAH, which can help with their homework, check-in, and provide guidance. SARAH would have the ability to detect what the student is good at, poor at, and provide a rating to the teacher and parents. SARAH may well stay with the child through to high school and then into their career.[29] As demonstrated, this may help students to have a supportive and affirmative voice by their side through their schooling; but they may learn that the world is full of people who say, 'good job' or 'go ahead.' SARAH is also then drawing on a 'fairly homogenous and limited dataset and a restricted worldview that's generated as a result of that dataset'.[30]

Dependency on GenAI

3.18 Many submissions raised concerns that students and educators might over rely on GenAI, and that this would have flow on effects. Students from The Grange P–12 College shared with the Committee that they wanted to determine how they use the technology.[31] They stated that GenAI should be used as a secondary resource to supplement evidence rather than substitute it, and that all evidence should be corroborated.[32] One student said:

> But I think any use of ChatGPT should be just guidance and not a crutch. We should utilise the other resources that we have, such as textbooks, our teachers and even other sources on the internet. If we are using ChatGPT in schools, it's important to emphasise that we shouldn't rely solely on that and that we should double check it. [33]

3.19 Australian Council of State School Organisations (ACSSO) also asserted that GenAI tools should be used as a supporting resource and not as a substitute for face-to-face learning and in-person interactions.[34] If used as a supporting resource, GenAI could potentially enhance learning and the role of the teachers. Whereas if students rely too heavily on GenAI, it could detract from teachers' roles, even threatening to replace them.[35]

3.20 The National Tertiary Education Union (NTEU) did not consider GenAI an appropriate replacement for staff as the technology did not 'engage [students] in critical thinking, [or] produce genuine creativity or innovation', and human staff are

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29 Dr Michael Kollo, Chief Executive Officer, Evolved Reasoning, *Committee Hansard,* 15 November 2023, p. 6.

30 Dr Kollo, Evolved Reasoning, *Committee Hansard*, 15 November 2023, p. 6; Associate Professor Joanne O'Mara; President, VATE, and Mr Leon Furze, Council Member, VATE, *Committee Hansard,* 15 November 2023, pp. 9–10.

31 Deshnysri, Year 10 Student, The Grange P–2 College, *Committee Hansard,* 13 March 2024, p. 7.

32 Ean, Year 10 Student and Leo, Year 11 Student, The Grange P-12 College, *Committee Hansard,* March 2024, p. 7.

33 Amy, Year 12 Student, The Grange P–2 College, *Committee Hansard,* 13 March 2024, p. 4.

34 Australian Council of State School Organisations (ACSSO), *Submission 25*, p. 2.

35 Mrs Lorraine Finlay, Human Rights Commissioner, Australian Human Rights Commission, *Committee Hansard*, 4 October 2023, p. 17; Maeve, Year 12 Student, The Grange P–12 College, *Committee Hansard,* 13 March 2024, p. 2.

still required to monitor GenAI outputs.[36] As GenAI is trained on data and all data is historical, 'an over-reliance on AI may limit innovation, insight, and discovery'. As such, Tertiary Education Quality and Standards Agency (TEQSA) considered it crucial to scaffold the introduction of GenAI technology throughout a student's education journey so that they develop critical thinking skills needed to progress.[37]

3.21 An over-reliance on GenAI can also adversely affect students' problem-solving skills, interpersonal skills, and decision-making skills, and lead to complacency and disengagement from teaching material.[38] This may hamper human capacity through the reduction of individual capabilities and could risk the mass production of AI generated content.[39] A related issue is the tendency for GenAI to 'produce plausible but incorrect responses' and join discrete concepts in a logical manner. This may affect student learning and understanding, especially if they rely solely on GenAI.[40]

3.22 The Committee heard that if students become dependent on GenAI, students may be deterred from using and building their skills that require effort and time.[41] Monash DeepNeuron and the Victorian Association for the Teaching of English pointed to the example of the normalisation of spellcheck and grammar checks and the proliferation of applications such as Grammarly.[42] Monash DeepNeuron asserted that the use of spelling and grammar checkers can lead to a decline in fundamental spelling and grammar skills as they reduce student surface errors, but do not correct errors on a cognitive level.[43] Rather, these skills need to be cultivated through project-based learning, inquiry-based approaches, and real-world problem-solving activities that demonstrate the limitations of the technology.[44]

3.23 It is therefore important to implement a balanced curriculum and foster skills such as collaboration, critical thinking, and creativity that GenAI cannot replicate.[45] Teachers should carefully monitor these activities to ensure the development of such skills amongst students.[46]

Mis- and disinformation

3.24 The ability of GenAI to proliferate mis- and disinformation on their platforms was identified as a risk. Misinformation poses a risk to the health and safety of individuals and society more broadly through the dissemination of 'made-up news articles, doctored images and videos, false information shared on social media, and scam

36 National Tertiary Education Union (NTEU), *Submission 52*, p. 5.
37 Tertiary Education Quality and Standards Agency (TEQSA), *Submission 33*, p. 6.
38 University of Technology Sydney Centre for Research on Education in a Digital Society (UTS CREDS), *Submission 19*, p. 10; Monash DeepNeuron, *Submission 75*, p. 5; PLC, *Submission 93*, p. 8; Dr Pethigamage Perera, *Submission 7*, p. 4.
39 UTS CREDS, *Submission 19*, p. 11.
40 Australasian Academic Integrity Network (AAIN), *Submission 58*, p. 9.
41 Monash DeepNeuron, *Submission 75*, p. 5.
42 Victorian Association for the Teaching of English, *Submission 10*, p. 5.
43 Monash DeepNeuron, *Submission 75*, p. 5.
44 ACSSO, *Submission 25*, p. 4.
45 PLC, *Submission 93*, p. 8.
46 ACSSO, *Submission 25*, p. 4.

advertisements. It becomes disinformation when misinformation is deliberately spread to cause 'confusion and undermine trust in governments or institutions'.[47]

3.25 The Committee heard that mis- and disinformation can foster distrust and biases between people and cultures, leading to poor outcomes for students.[48] The spread of misinformation within school and wider communities can affect students' wellbeing and their understanding of current events.[49] Furthermore, Monash DeepNeuron stated that when misinformation is used for propaganda and other political purposes, it can radicalise GenAI users.[50]

3.26 Another concern related to mis- and disinformation is the proliferation of deepfakes and that GenAI can create them. A deepfake is a 'digital photo, video, or sound file of a real person that has been edited to create a false depiction of them doing or saying something'.[51] The Australian Human Rights Commission (AHRC) submitted that GenAI can be corrupted for misuse by generating 'high-quality, cheap and personalised content, including for harmful purposes' to generate deepfakes.[52] These tools have the potential to cause significant harms and can be used to exploit, harass, ridicule, and spread mis- and disinformation.[53]

3.27 The Commonwealth Department of Education (Commonwealth DoE) has raised concerns about the use of GenAI to create deepfake material and has noted that 70 per cent of Australians aged 18 to 24 years have experienced harassment or abuse online in a 12-month period.[54] The eSafety Commissioner has defined a deepfake as a 'digital photo, video or audio file of a real person that has been manipulated to create an extremely realistic but false depiction of them doing or saying something that they did not actually do or say'. The eSafety Commissioner cautions that GenAI tools allow the ability to produce deepfakes with greater ease and at scale, which could result in serious and widespread harm to educators.[55]

3.28 On the proliferation of deepfake apps, Associate Professor Erica Southgate asserts:

> Deepfake apps will pose significant challenges to schools and other educational institutions as they are weaponised for bullying, harassment, and deception. The rapid human and bot spread of deep fakes will probably surpass the damage already occurring with student online bullying and will adversely affect staff who are targeted and the ethical culture of the educational institution. The anonymity through which deep fakes can be created will exacerbate the issue.[56]

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47 'Online Misinformation', *Australian Communications and Media Authority*, 7 February 2024, viewed 24 April 2024.
48 UTS CREDS, *Submission 19*, p. 12.
49 ISA, *Submission 22*, p. 10.
50 Monash DeepNeuron, *Submission 75*, p. 4.
51 Department of Education (DoE), *Submission 48*, p. 8.
52 Australian Human Rights Commission (AHRC), *Submission 65*, p. 10.
53 DoE, *Submission 48*, p. 8.
54 DoE, *Submission 48*, pp. 8–9.
55 eSafety Commissioner, *Submission 84*, p. 2.
56 Associate Professor Erica Southgate, *Submission 72*, p. 5.

3.29 Furthermore, GenAI cannot separate fact from fiction, nor truth from disinformation or stories from news.[57] AI tools can also 'hallucinate' content and produce factual errors in generated content. This includes fabricated moments in history and inaccurate scientific information and facts.[58] The Tech Council of Australia emphasised that this is why GenAI models should not be considered 'intelligent', reiterating that they work on a predicative basis and trained data.[59]

3.30 Students with insufficient knowledge or skills may be unable to interpret opinions expressed as fact, from experts or amateurs, are at risk of accepting misinformation at face value, especially if they trust AI-generated information.[60] Biased content in and of itself can further promote misinformation within student cohorts.[61]

3.31 The CDW used Finland as an example of combatting disinformation. Finland has a strong focus on combatting disinformation which specialises in developing digital literacy capabilities and a healthy relationship with technology. This is embedded in every part of the school curriculum from K–12.[62]

3.32 The AHRC recommended that the use of GenAI to create deceptive or malicious content in education settings be prohibited, and that policies be developed to ensure content verification so that individuals can accurately identify GenAI content. The AHRC further noted that these reforms would be insufficient if there were no digital literacy education and training that teaches GenAI users to identify false or manipulated content and to engage with technology responsibly and ethically.[63] The Australian Library and Information Association (ALIA) recommended implementing a program to monitor GenAI outputs in education settings and for GenAI developers to commit to improving their algorithms in response to the findings.[64]

3.33 TEQSA made the following recommendations to the Committee, including:

- the need for 'transparent disclosure of the training data and algorithms that underpin educational products so that they can be genuinely evaluated by government and educational institutions to ensure they are free of bias' with the onus on EdTech companies to make the information intelligible
- the need for 'developers to ensure that they are mindful of, and seek to eliminate, bias and discrimination through the data the model is trained on, the design of the model and its suggested applications'
- a requirement for educational administrators and institutions to ensure models and their applications are evaluated for bias and that their use is governed by institutional policies, and that adherence is monitored.[65]

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57 Grok Academy, *Submission 94*, p. 3.
58 Tech for Social Good (TFSG), *Submission 32*, p. 6.
59 Tech Council of Australia, *Submission 90*, pp. 4–5.
60 Grok Academy, *Submission 94*, p. 3; Independent Education Union of Australia (IEUA), *Submission 26*, p. 4.
61 Monash DeepNeuron, *Submission 75*, p. 4.
62 Ms Wilshire, CDW, *Committee Hansard*, 4 October 2023, p. 8.
63 AHRC, *Submission 65*, p. 11.
64 Australian Library and Information Association (ALIA), *Submission 51*, p. 15.
65 TEQSA, *Submission 33*, p. 9.

Transparency

3.34 Several submissions raised concerns about the lack of transparency in GenAI applications and how this may affect student welfare. Issues relating to data sources, built-in surveillance in the platforms, costs and the commercialisation of the data, and applications of the EdTech were identified. There is a need to ensure that there is transparency in the gathering and aggregation of data, and how that may influence user decisions.[66]

3.35 Professor Davis explained issues of transparency:

> Finally, on the behemoth point, the reason we have that competition problem is often that we don't have transparency about a level playing field in terms of outcomes and standards for what actually works. Secondly, a lot of tech companies are subsidising the use of services through the use of data at the back end—data broking, data leveraging and other areas. It goes back to the Privacy Act review and really protecting children's data from secondary use. Thirdly, we need transparency on the true cost of systems over time. At the moment, all our ChatGPT use is being subsidised by investors, stakeholders and one big tech company in the world.[67]

3.36 The Commonwealth DoE noted a lack of information about the development and commercialisation of GenAI models, which affects Government's ability to understand its potential effects.[68] There is currently a lack of transparency about the 'scientific', and 'pedagogic logic' that is behind the model or what data it has been trained on. Similarly, Dr Jose-Miguel Bello y Villarino, Senior Research Fellow, ARC Centre of Excellence for Automatic Decision-Making and Society, asserted that there needs to be some transparency about what GenAI developers have embedded into the application, and what is missing.[69] If there is little transparency on the sources and algorithms it may lead to a 'veneer of objectivity' of large language models (LLMs), which can make students naive to quality and bias issues.[70]

3.37 The Committee heard that when there is a lack of transparency in GenAI models, it makes it difficult for users including children, teachers, and parents to understand how the technology functions. This can make it challenging for users to understand how they arrived at specific outputs, which can lead to challenges about developer accountability, concealed bias, discrimination, and errors. This can also lead to trust in the AI model without the critical judgement needed to confront biases and false information that can be prevalent on the applications. When there is a lack of transparency in the decision making process, 'it becomes difficult to assess whether the system is making unbiased choices due to its ability to hide biases and

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66 South Australia Department for Education (SA DFE), *Submission 2*, p. 6.

67 Professor Davis, UTS, *Committee Hansard*, 6 September 2023, p. 9.

68 DoE, *Submission 48*, p. 8.

69 Dr Jose-Miguel Bello y Villarino, Senior Research Fellow, ARC Centre of Excellence for Automatic Decision-Making and Society, The University of Sydney, *Committee Hansard,* 30 January 2024, p. 19; ARC Centre of Excellence for the Digital Child, *Submission 13*, p. 5.

70 Edith Cowan University, *Submission 17*, p.3.

discriminatory patterns'. Without transparency, there is no external oversight or means of correction.[71]

Algorithmic bias

3.38 GenAI systems 'depend on robust and quality datasets to write, improve, and test algorithms'. This ensures accurate and reasonable outputs and minimises the risks of bias or incompleteness in results.[72] However, GenAI systems are often trained on large, imperfect datasets that can 'generate predictive outputs based on algorithms' and 'systematically reinforce bias and prejudice, historical discrimination, and archaic practices'.[73] Models can reinforce bias and disadvantage by excluding marginalised and underrepresented groups or even overrepresenting some groups if misused or poorly designed.[74]

3.39 This issue of misuse perpetuating adverse outputs was highlighted by Dr Alexia Maddox, Senior Lecturer in Pedagogy and Education Futures at La Trobe University:

> Again, I would very much reinforce this point: what is the data that these tools are learning on? The fact is that it's not just the data that gets ingested into the tools; it's also the data that people produce when they're using the tools.[75]

3.40 The below factors were identified as affecting the quality and accuracy of GenAI inputs and outputs.

- The age or scope of the dataset, the use of foreign data, such as US-based material or even older material from the public domain. These datasets do not represent a diverse sample and can be exclusionary.[76]
- Factual inaccuracies where GenAI can produce 'plausible but incorrect responses' and its inability 'to join discrete concepts in ways that appear to be logical' which may impact student learning.[77]
- Aboriginal and Torres Strait Islanders are underrepresented in data samples and there are often factual inaccuracies about their cultural practices.[78] This may lead to Aboriginal and Torres Strait Islander students having a 'poverty of connection to culture' and a further erasure through the lack of visibility in GenAI datasets.[79]
- An accreditation or regulatory framework may not standardise the AI tools available or ensure that the training data is ethical and transparent.[80]

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71 CDW, *Submission 83*, p. 8.
72 Copyright Advisory Group (CAG), *Submission 36*, p. 8.
73 AHRC, *Submission 65*, p. 10; Monash DeepNeuron, *Submission 75*, p. 4.
74 AHRC, *Submission 65*, p. 10; CAG, *Submission 36*, p. 8; TEQSA, *Submission 33*, p. 7.
75 Dr Alexia Maddox, Senior Lecturer in Pedagogy and Education Futures, School of Education, La Trobe University, *Committee Hansard,* 9 November 2023, p. 17.
76 CAG, *Submission 36*, p. 8.
77 AAIN, *Submission 58*, p. 9.
78 AAIN, *Submission 58*, p. 9; Ms Ine Beerens, Senior Manager, Centre for Digital Wellbeing (CDW), *Committee Hansard*, 4 October 2023, p. 7.
79 School of Education, La Trobe University, *Submission 91*, p. 9.
80 Ms Beerens, CDW, *Committee Hansard*, 4 October 2023, p. 7.

3.41 ALIA asserted that the majority of datasets have been scraped from the internet and have differing levels of transparency about their content. Content that is scraped from the internet can vary in quality and relevance to educational contexts and is often western-centric.[81] For example, ChatGPT3 was trained with text from the internet (85 per cent total); yet the training sets for ChatGPT4 are not public. Furthermore, users' data may be scraped to inform GenAI tools, which may lead to inequitable outcomes for models trained on that data.[82]

3.42 GenAI also functions on a probabilistic model. The technology produces a 'probable combination of pixels, words or other medium in response to a specific prompt', leading to biases in student responses.[83] This means that the AI model learns 'facts' based on quantity and not quality of content and outputs.[84]

3.43 The Committee heard that students who are exposed to biased GenAI outputs may be at risk of mirroring the misconceptions and stereotypes that are produced by the technology.[85] Even when aware of the bias or stereotype, people may still be receptive to them.[86] Algorithmic bias may entrench or obscure unfairness which may 'reinforce discriminatory practices and widen educational disparities'.[87] This could lead to adverse outcomes for students in areas including grading and university admissions, and affect personalised learning paths.[88]

3.44 Moreover, stakeholders highlighted that GenAI is fallible and multiple submissions included examples of bias produced by the technology, including:

- ChatGPT has a propensity to perpetuate gender and racial stereotypes; likening men to 'doctors' and 'engineers,' women to 'nurses' and 'teachers' and 'thief' or 'criminal' to people of colour[89]
- ALIA asked ChatGPT to write a story about two children set in Australia. The tool wrote a piece using two anglicised names and when asked to rewrite the story with different names, continued to provide traditional English-speaking names that are not necessarily representative of modern Australian society[90]
- when prompted with images of 'kids soccer team having fun', it only showed boys playing soccer and having fun.[91]

3.45 Conversely, PLC suggested that GenAI technology relies on human feedback for the reinforcement of learning and can be quite circumspect and calibrate answers back to the centre. This was contrasted to platforms such as YouTube and TikTok, which are large algorithmic tools that are vying for the users' attention. On those platforms,

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81 ALIA, *Submission 51*, p. 8; Tech Council of Australia, *Submission 90*, p. 5.
82 UTS CREDS, *Submission 19*, p. 13.
83 ALIA, *Submission 51*, p. 9.
84 ARC Centre of Excellence for the Digital Child, *Submission 13*, p. 3.
85 Monash DeepNeuron, *Submission 75*, p.4.
86 ALIA, *Submission 51*, p. 9.
87 FPCA NSW, *Submission 43*, p. 5.
88 PLC, *Submission 93*, p. 7.
89 Monash DeepNeuron, *Submission 75*, p. 4.
90 ALIA, *Submission 51*, p. 9.
91 Mrs Migliorini, KomplyAi, *Committee Hansard*, 29 January 2024, p. 18.

the further down the rabbit hole a user goes, the more biased and extreme content they will be shown.[92]

3.46 The AHRC considered it important to address bias in GenAI outputs to ensure that Australia's education is 'fair, inclusive and promotes equal opportunities for all students'.[93] The Tech Council of Australia contended that educational institutions can create a knowledge base with trusted sources of information; consider the removal of inappropriate external sources from the tools, with a focus on sensitive topics; and, introduce human review and application of critical thinking skills to identify bias.[94]

3.47 The CDW suggested the development of comprehensive legislation for GenAI that leans on international best-practice such as the EU AI Act.[95] Similarly, the AHRC recommended that there should be continual evaluation and validation processes and regular independent auditing to 'identify and mitigate algorithmic bias'.[96]

EdTech interests

3.48 In 2020, the Australian EdTech sector employed 13,000 people and generated $1.6 billion in domestic revenue and an additional $600 million from exports to the international market.[97] Submissions expressed concern that EdTech and commercial interests may affect the rollout of GenAI in the Australian education system.

3.49 Monash DeepNeuron highlighted that as GenAI services expand, they will become heavily commercialised.[98] In Monash DeepNeuron's view, the EdTech sector has a history of prioritising commercial interests over student outcomes, which has led to the delivery of content that is 'poorly tailored to student needs'.[99] There are also risks that GenAI will be controlled by commercial, overseas interests, with commercial or profit-driven motives and who may not address concerns raised by education professionals.[100]

3.50 In its submission, the Centre for Research on Education in a Digital Society (CREDS) cited a review of the 100 most frequently used EdTech tools in the US which found that only 26 out of 100 met the threshold for any level of learning. It was noted that poor application development can lead to underuse and poor use, and may not represent Australian values or experiences. As such, it is important that investments

92 Mr Anthony England, Director, Innovative Learning Technologies, Pymble Ladies' College, *Committee Hansard*, 29 January 2024, p. 3.
93 AHRC, *Submission 65*, p. 10.
94 Tech Council of Australia, *Submission 90*, p. 5.
95 Ms Wilshire, CDW, *Committee Hansard*, 4 October 2023, p. 5.
96 AHRC, *Submission 65*, p. 11.
97 UTS CREDS, *Submission 19*, p. 5.
98 Mr Nicholas Chan, Education Lead, Monash DeepNeuron, *Committee Hansard*, 9 November 2023, p. 22.
99 IEUA, *Submission 26*, p. 3.
100 Mr Kevin Bates, Federal Secretary, Australian Education Union, *Committee Hansard,* 2 November 2023, p. 1; IEUA, *Submission 26*, p. 3.

in EdTech are underpinned by evidence that the tools will be used to support the outcomes they claim to target.[101]

3.51 The Committee heard that children are placed at particular risk if EdTech interests are allowed to grow unfettered. This is because a principal risk of EdTech is the sale or transfer of children's personal data to third parties or, in the case of GenAI, 'the use of student search queries being analysed to inform targeted advertising'. The AHRC noted that by a child's 13th birthday, advertisers will have already gathered more than 72 million data points about them. It is therefore critical that data collected through EdTech not be used for other purposes and children are protected from data surveillance.[102]

3.52 There is a prevailing sentiment that Australia has and will need to continue to set a high-quality threshold for EdTech products. Failure to set a sufficiently high threshold will see products sold at the lower quality threshold that they're already operating at.[103] EdTech will become more advanced, sophisticated and intuitive as the technology grows and more AI components are built into their systems.[104]

3.53 Australia is well positioned to integrate GenAI EdTech into the education systems with the *Safer Technologies 4 Schools Framework*, to which all Australian education ministers have signed up. A number of domestic and international EdTech companies have signed up to be accredited under this program, which operates under the auspices of the Commonwealth DoE.[105]

3.54 Dr Curran states it will be important to set strong standards that the industry has to reach to operate in the Australian market.[106] Professor Leslie Loble AM, Industry Professor at the University of Technology Sydney, supported the introduction of standards so that they can compete on quality. If an EdTech company has invested a huge amount of money in a product, they do not want that undercut by someone who has not and who is at the lower end of the quality threshold.[107] Professor Loble recommended that educators 'must retain authority and control over EdTech used in classrooms', ensure the use of quality tools, the 'effective use and integration into teacher-led instruction', and ensure a strong network of policies, institutions and incentives to shape and govern the EdTech market.[108]

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101 UTS CREDS, *Submission 19*, p. 5.
102 AHRC, *Submission 65*, p. 11.
103 Dr Curran, Grok Academy, *Committee Hansard,* 20 March 2024, pp. 10–11.
104 Ms Julie Birmingham, First Assistant Secretary, Teacher and Learning Division, DoE (DoE), *Committee Hansard,* 13 September 2023, p. 5.
105 Ms Sally Webster, K–12 Schools Industry Lead, Australia and New Zealand, Amazon Web Services, *Committee Hansard*, 29 November 2023, p. 8.
106 Dr Curran, Grok Academy, *Committee Hansard,* 20 March 2024, pp. 10–11.
107 Professor Leslie Loble AM, Industry Professor, University of Technology Sydney (UTS), *Committee Hansard*, 20 March 2024, pp. 10–11.
108 Professor Loble, UTS, *Submission 49*, p. 4.

Student data

3.55 In its submission, ALIA raised concerns that EdTech products are collecting and monetising student data. ALIA assert that the risk of collection and monetisation of student data will continue to increase given the fast-moving nature of the sector where there is a significant first mover advantage.[109] The NTEU stated that most advanced AI systems are being developed by foreign, for-profit entities that operate with little transparency about the types of data they collect and how it used. This presents a problem with educational institutions engaging external contractors to deliver teaching and student support.[110]

3.56 There are also concerns about algorithmic transparency in the grading and assessment of student work by AI systems. A lack of human presence in grading may also make the appeals process unfair and unclear.[111]

3.57 Stakeholders suggested ways to create transparency in GenAI use, including:

- guidelines: transparency and accountability can be emphasised through clear protocols and guidelines which govern the use and reporting of AI-generated outputs[112]
- transparent data use policies: 'educational institutions and AI developers should be required to have clear and transparent data use policies' including how data is collected, how data will be used, how long data will be retained, and what measures are being taken to protect data privacy[113]
- open access: researchers and developers need to prioritise transparency and explainability by providing clear documentation, sharing methodologies, and engaging in open dialogue.[114] This would allow researchers and the broader public to understand what is happening behind the scenes to determine if the measures in place are suitable to regulate the technology[115]
- transparency reports: AI-organisations should publish transparency reports detailing how their systems are used, how algorithms function and how they affect users[116]
- third party evaluations: there should be independent third-party evaluations of AI tools and systems to ensure that they are transparent, fair and accountable.[117]

109 ALIA, *Submission 51*, p. 9.
110 NTEU, *Submission 52*, p. 7.
111 NTEU, *Submission 52*, p. 7.
112 University of South Australia, *Submission 29*, p. 3.
113 CDW, *Submission 83*, p. 9.
114 ACSSO, *Submission 25*, p. 5.
115 Ms Kelly Tallon, Manager, Regulatory Policy and Strategy, Office of the eSafety Commissioner, *Committee Hansard*, 4 October 2023, p. 11.
116 CDW, *Submission 83*, p. 9.
117 CDW, *Submission 83*, p. 9.

Data security

3.58 The COVID-19 pandemic necessitated the adoption of EdTech products into Australian schools to manage online learning and the establishment of the virtual classroom. The Committee heard that the speed of uptake of EdTech products by schools raises concerns about data privacy and the security of sensitive student information. The CDW asserted that 89 per cent of the EdTech platforms available put children's safety in danger by 'monitoring them without their consent and allowing access from or selling the data to third parties'.[118] In its submission, Charles Sturt University reported:

> Over four million Australian children's data may have been compromised in 2022 due to unsolicited cookies integrated into EdTech products used in Australian schools, infringing on their privacy and exposing risks such as lack of informed consent, privacy erosion, and cyber security issues.[119]

3.59 The CDW stated that access to children's data can leave them susceptible to commercial exploitation by exposing them to overt advertising or sponsored content. The adoption of this type of EdTech can be problematic as children under age 12 'do not understand the pervasive nature of advertising and children 8 years and under cannot differentiate between content and advertising', making them susceptible to microtargeted marketing.[120]

3.60 The use of GenAI in education raises issues about how data is stored, who can access it, and how it used.[121] For example, data entered into GenAI tools may become the property of the owners of the tools, raising concerns about the privacy and security of the data, something which may be problematic where products build user profiles over a period of time.[122]

3.61 If the adoption of GenAI in the classroom becomes compulsory, there may be limited opportunities for teachers, children, or parents to opt-out, or even provide full consent to use of the technology.[123] Most GenAI companies are aware of these issues and have a set an 18+ age restriction for accounts.[124]

3.62 Even if students' data is not sold, students may still be exposed to risk through the continuous gathering of personal data, used to optimise the individual user experience.[125] There are cyber security and data security concerns that Australian schools may be under-resourced, or lack expertise, to address.[126] In its submission,

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118 CDW, *Submission 83*, p. 6.
119 Charles Sturt University, *Submission 98*, p. 2
120 CDW, *Submission 83*, p. 6.
121 PLC, *Submission 93*, p. 7.
122 SA DFE, *Submission 2*, pp. 5–6.
123 CDW, *Submission 83*, pp. 6–7.
124 AATSE, *Submission 14*, p. 4.
125 AHRC, *Submission 65*, p. 9.
126 CDW, *Submission 83*, p. 7; AHRC, *Submission 65*, p. 9.

PLC raises concern that additional costs will be needed to manage security measures and encryption.[127]

3.63 PLC noted that limited access to data may affect AI's ability to provide personalised learning for students.[128] This is because GenAI tools require sensitive personal data to function effectively such as a student's personal ID and academic records.[129] Some schools are cautious about integrating GenAI into teaching because of the large datasets required. This is to protect the personal information of students, teachers and other individuals as 'mismanagement of data can lead to privacy breaches, misuse of information, or unauthorized access, compromising the trust between educational institutions and stakeholders.'[130]

Protecting privacy

3.64 The right to privacy is a recognised human right that is becoming increasingly important in a data-centric world. The AHRC stated that GenAI has the capacity to intrude on people's privacy in new and concerning ways, if not properly regulated.[131] ATSE submitted that issues relating to data privacy are compounded by the different approaches to privacy across Australian jurisdictions and internationally.[132]

3.65 Several submissions pointed to the need to review the *Privacy Act 1988* (Cth) (the Privacy Act) with a view to strengthening privacy protections for children, particularly in relation to the use of GenAI.[133] Currently, there are no exemptions in Australia's privacy, consumer protection, or anti-discrimination laws for AI development and deployment.[134]

3.66 Professor Davis noted that the Privacy Act is 25 years out of date in certain respects, which may not be conducive to regulating emerging technologies.[135] However, Dr Aaron Lane from the RMIT Blockchain Innovation Hub asserted that Australia does not necessarily need to update Australia's privacy law, and that it already applies to GenAI.[136] The Privacy Act review by the Attorney-General's Department (AGD) could establish a 'robust data protection framework that outlines the rights of students in relation to personal data as well as establishing limitations to the collection, use and retention of data of minors'.[137] The Tech Council of Australia asserted that there is a

127 PLC, *Submission 93*, p. 7
128 PLC, *Submission 93*, p. 7
129 TFSG, *Submission 32*, p. 6.
130 ISA, *Submission 22*, p. 10; Cooperative Research Australia (CRA), *Submission 88*, p. 6.
131 AHRC, *Submission 65*, p. 9.
132 AATSE, *Submission 14*, p. 4.
133 AHRC, *Submission 65*, p. 9.
134 Mr Ryan Black, Head of Policy and Research, Tech Council of Australia, *Committee Hansard*, 11 October 2023, p. 3.
135 Professor Davis, UTS, *Committee Hansard,* 6 September 2024, p. 1.
136 Dr Aaron Lane, RMIT Blockchain Innovation Hub, *Committee Hansard*, 9 November 2023, p. 20.
137 CDW, *Submission 83*, p. 7.

need to consider arrangements that will apply for foundational and frontier models, domestically and at a global level.[138]

3.67 DISR is developing Australia's position on GenAI. The ATSE suggested that DISR develop enforceable data privacy standards that will help to regulate training and user-inputted data in AI systems.[139] Standards for the safe and secure use of GenAI tools should also seek to establish the storage of personal data, interactions with GenAI and the protection of intellectual property (IP).[140] The AHRC emphasised that standards should:

> Expressly protect student data, limit access to sensitive information, and ensure that robust privacy and security measures are in place. Standards should be established to govern the collect, storage and use of personal information in the context of generative AI tools in education.[141]

3.68 The AHRC cautioned that introduced standards should not be based on assumptions about what is in the best interests of children. Rather their views should be actively considered as an 'adult's interpretation of children's privacy needs can impede the healthy development of autonomy and independence and restrict children's privacy in the name of protection'. This can result in overly protectionist agendas which can be potentially harmful to children.[142]

3.69 Other measures to protect data and privacy include through encryption and adopting robust security protocols, only collecting necessary data and safeguarding sensitive information, and anonymising information wherever possible.[143] To adequately protect students from cyber security threats, the Cooperative Research Australia stated that the Australian Government can extend the *2020-2030 Australian Cyber Secretary Strategy* to protect AI models and education data from cyber threats and misuse.[144] Government can also provide both technical and financial support to educational institutions to protect students from cyber security threats.[145]

3.70 It may also be practical to adopt risk-based AI governance practices where appropriate. GenAI can be used in high-risk ways in education such as the automation of decisions that will meaningfully impact a student's wellbeing, and there should be a baseline expectation that organisations can implement appropriate governance-based safeguards to identify and mitigate these risks.[146]

3.71 Educators and administrators have a responsibility to use GenAI tools ethically and responsibly. This includes obtaining appropriate permissions for data usage that will ensure transparency in AI-generated content and to be accountable for the decisions

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138 Mr Black, Tech Council of Australia, *Committee Hansard*, 11 October 2023, p. 3.
139 AATSE, *Submission 14*, p. 4.
140 AAIN, *Submission 58*, p. 9.
141 AHRC, *Submission 65*, p. 9.
142 AHRC, *Submission 65*, p. 6.
143 PLC, *Submission 93*, p. 7; ACSSO, *Submission 25*, p. 10.
144 CRA*, Submission 88*, p. 7.
145 CDW, *Submission 83*, p. 7.
146 Amazon Web Services, *Submission 85*, p. 6.

made based on GenAI outputs.[147] Data should only be used for educational purposes, and be protected from unauthorised access.[148]

3.72 ACSSO advised that it is important to have strong data protection laws and regulations so that there are transparent practices and individual users are informed about how their data is used.[149] Similarly, the CDW put forward that government can require AI developers and educational institutions to implement secure data storage practices, and strong encryption practices which detail the types of data collected and their purposes, how the data will be used, how long it will be retained, and the measures taken to protect users' privacy.[150] The IEUA also outlined the need for the sharing of personal data to meet the highest privacy standards by having clear limits on:

- the type of data to be shared
- where and how data will be stored
- the length of time that data may be stored
- the purpose for retrieving data
- personnel who can access the data, must be provided to ensure clarity exists for those managing this matter within schools.[151]

3.73 The CDW suggested that 'AI tools used in education should be assessed for their privacy impact by the Office of the Australian Information Commissioner'. Such an assessment could identify potential risks to data privacy and outline mitigation measures to take before implementation of the tool.[152]

Copyright

3.74 Throughout the inquiry, the use of copyrighted material was identified as a risk of GenAI use in the Australian education system. The Commonwealth DoE is currently working with AGD to engage with the education sector to manage copyright issues.[153] In December 2023, AGD announced the establishment of the copyright and AI reference group, which will take carriage of this issue.[154] As many stakeholders considered copyright and GenAI, some key themes are described below.

3.75 In Australia, for content to be protected by copyright, it must fall into one of eight categories: 'a work—literary, dramatic, musical or artistic work, or subject matter other than works—a film, sound recording, broadcast or published edition'. It must

147 ISA, *Submission 22*, p. 10.
148 CRA*, Submission 88*, pp 6-7.
149 ACSSO, *Submission 25*, p. 5.
150 CDW, *Submission 83*, p. 7.
151 IEUA, *Submission 26 Attachment A*, p. 4.
152 CDW, *Submission 83*, p. 7.
153 Ms Birmingham, DoE, *Committee Hansard*, 6 March 2024, p. 6.
154 Mr Chris Davern, Assistant Secretary, Strategic Policy Branch, Strategy, Data and Measurement Division, Corporate and Enabling Services Group, DoE DoE, *Committee Hansard*, 6 March 2024, p. 6.

also be 'sufficiently 'original'…be in 'material form'…and have a sufficient connection to Australia'.[155]

3.76 The Copyright Advisory Group noted two main issues with GenAI and copyright. First, in its current form, Australian copyright law does not provide any exceptions that would allow AI platforms to use third party material and datasets for ML. Second, there are issues around how to define the legal status of GenAI outputs and how they can be used in teaching and learning.[156]

3.77 The National Copyright Unit has been unable to provide definitive copyright advice due to the lack of clarity on the legal status of GenAI platforms and the processes that used to generate content or modify existing works.[157]

3.78 The Committee also heard that there are administrative complexities as obtaining a licence for every input to an AI system would be prohibitive. As such, 'practical and legal access to rich datasets for the purpose of training AI systems and tools is imperative in order to serve the public interest and mitigate the potential of bias in our AI systems.'[158] Schools use large amounts of digital content that was not intended for commercial exploitation with much of it being made freely available on the internet. Schools are currently expected to pay millions of dollars each year to copy, print, or email material that had no expectation of payment to the copyright owner.[159]

3.79 The Australian Publishers Society similarly raised concerns regarding educators using AI without adequate regulatory oversight, copyright and IP issues jeopardising the creation of new Australian learning materials, and the risk posed by unregulated GenAI to the quality, diversity and authenticity of educational content.[160]

3.80 As GenAI models are trained by ingesting large amounts of text to produce outputs, the models are reliant on the quality of the training dataset. The Australian Society of Authors advised that OpenAI has admitted that it could not have created AI tools without using copyright materials as input.[161] Stakeholders also observed that AI platforms have used, stolen and pirated content without permission from creators or rightsholders, raising concerns about copyright infringement. It is argued that the tech sector has appropriated creators' content without payment, and this has the potential to significantly reduce the income of those in Australia's creative industries, in turn compromising the quality of Australian educational content.[162] The Australian Society of Authors is aware of 130 authors who have had their work used without permission.[163]

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155 Australian Copyright Council, *Submission 69,* p. 2.
156 CAG, *Submission 36*, p. 4.
157 CAG, *Submission 36,* p. 5.
158 CAG, *Submission 36*, p. 7.
159 CAG, *Submission 36*, p.13.
160 The Australian Publishers Association (APA), *Submission 101*, pp. 1–2.
161 Australian Society of Authors (ASA), *Submission 102*, p. 2.
162 Copyright Agency, *Submission 80*, pp. 1–2; APA, *Submission 101*, pp. 2–3.
163 ASA, *Submission 102*, p. 2.

3.81 Evidence requested by the Committee highlighted concerns about Indigenous Cultural and Intellectual Property (ICIP) and Indigenous Data Sovereignty. Copyright Agency asserted that Aboriginal and Torres Strait Islanders are concerned about 'maintaining authenticity in relation to their culture, and control over how aspects of their culture is used by others'.[164] GenAI may be used to 'produce and perpetuate inauthentic and fake art, and appropriate Aboriginal and Torres Strait Islanders' art, design, stories and culture without reference to Traditional cultural protocols'.[165] The risk that ICIP be incorporated into GenAI models without appropriate attribution or acknowledgement should be minimised.[166]

Committee comment

3.82 The Committee heard extensively about a range of serious risks and challenges presented by GenAI in education. These can relate to the technology itself, the ways it is used, and the data inputs and outputs. Key concerns exist around student safety and wellbeing—such as deepfakes and cyberbullying—the potential for overreliance on GenAI, mis- and disinformation, algorithm bias, data protection, and transparency.

3.83 There are additional risks and vulnerabilities associated with dealing with minors. For instance, the Committee notes the work underway by AGD on privacy and copyright concerns, including in relation to AI, and calls for a focus on children and GenAI as part of this process.

3.84 The Australian Government and other key players need to manage these risks as a matter of priority by implementing safeguards and restrictions to protect students and educators. Safety and related concerns are paramount. The Australian Government is already rolling out reforms regarding the safety and wellbeing of children and technology, such as around deep fakes, cyberbullying and the use of mobiles in the classroom. There are also concerns about the security of data, including for student data to not be sold to third parties or landing offshore.

3.85 It is clear to the Committee that the Australian Government can play a leadership role in mitigating the challenges that arise from GenAI in education. The Australian Government can identify, coordinate, and help implement compulsory and voluntary guardrails. This includes a focus on the safe, responsible and ethical use of GenAI, the EdTech market—including developers, deployers and end-users—and the technology and data.

3.86 The Committee encourages the Australian Government to build a solid network of policies, regulations and incentives to shape and govern the market for GenAI products for the Australian education system. It is possible to regulate GenAI products in the education sector by focussing on a system-wide approach, without requiring sector-specific regulation. Any measures should be aimed at ensuring that EdTech companies and developers are transparent and fair, and held accountable to

164 Copyright Agency, *Submission 80*, p. 2
165 ASA, *Submission 102*, p. 4.
166 AAIN, *Submission 58*, p. 9.

address significant risks, including algorithmic bias and discrimination, data security and privacy. Ed Tech companies and developers should be able to respond to evidence about what constitutes high-quality educational tools to assist learning and teaching.

3.87 There has been an explosion of GenAI tools, and the Committee commends the guidance being developed on how to select appropriate tools for Australia's education settings. It is important to set strong standards that industry has to meet to operate in the Australian market, and to have robust data protection frameworks.

3.88 Everyone has a role to play in safeguarding against risks, from students to educators to institutions. Take for example, algorithmic bias. GenAI systems can produce unfair or discriminatory content and can show partiality in inappropriate contexts, perpetuating societal bias and inhibit critical thinking. It is essential to mitigate risks of bias—and misinformation and disinformation—in AI generated outputs. It is the Committee's view that educators should be able to teach students the required skills to critique AI generated outputs, and educational providers should undertake regular independent audits of bias in the AI systems employed within their institutions to reduce these risks.

Recommendation 11

3.89 The Committee recommends that the Australian Government:

- **regulate EdTech companies and developers through a system-wide risks-based legal framework**
- **regulate unacceptable risks and high-risk AI systems in the education sector, mandate guardrails, and give the law extraterritorial effect**
- **ensure EdTech companies and developers' products meet established standards, including through testing and independent quality assurance**
- **require EdTech companies and developers to share critical information about how their AI systems are trained, what data it has been trained on, and how algorithms function and affect users**
- **require EdTech companies to provide a Gender Impact Assessment to be completed.**

Recommendation 12

3.90 The Committee recommends that the Australian Government work with AI developers and educational institutions to create robust data protection frameworks. This includes, but is not limited to:

- **outlining students' and other users' rights regarding their personal data**
- **identifying the measures taken to protect users' privacy**

- **limiting, and getting permissions for, the collection, use, and retention of students' data, including:**
    - **that certain types of data be collected**
    - **that data should only be used for educational purposes**
    - **that data be protected from unauthorised access and to have strong encryption practices in place**
    - **where, how, and for how long data can be stored**
    - **the purpose for retrieving data and who can access the data**
    - **that users' data is not stored offshore or sold to third parties.**

Recommendation 13

3.91 The Committee recommends that the Australian Government work with educational providers to mitigate the risks of algorithmic bias and mis- and disinformation by:

- **training educators to teach students how to critique AI generated outputs**
- **mandating that institutional deployers of AI systems in educational settings run regular bias audits and testing**
- **prohibiting the use of GenAI to create deceptive or malicious content in education settings**
- **completing risk-assessments**
    - **for example, identifying and seeking to eliminate bias and discrimination through the data the model is trained on, the design of the model and its intended uses**
    - **mandating to allow independent researchers 'under the hood' access to algorithmic information.**

Recommendation 14

3.92 The Committee recommends that the Australian Government:

- **ensure that the privacy law reforms led by the Attorney-General's Department include strengthening privacy protections for students, including minors, regarding the use of GenAI**
- **encourage the Office of the Australian Information Commissioner to develop an impact assessment measure which can identify the data privacy risks of GenAI tools use in education, and includes pre-deployment measures for implementation of GenAI tools.**

4. Opportunities as educational tool

Educational uses

4.1 Generative artificial intelligence (GenAI) can be used in educational contexts in many ways. The technology can act as a standalone tool or be integrated into other systems and platforms. GenAI presents ample potential opportunities for students, educators, and the broader education workforce. As shown by Figure 4.1, GenAI tools such as ChatGPT can perform a wide range of tasks to assist users in the education space.[1]

Figure 4.1 Uses of ChatGPT

Role[6]	Description	Example of implementation
Possibility engine	AI generates alternative ways of expressing an idea	Students write queries in ChatGPT and use the Regenerate response function to examine alternative responses.
Socratic opponent	AI acts as an opponent to develop and argument	Students enter prompts into ChatGPT following the structure of a conversation or debate. Teachers can ask students to use ChatGPT to prepare for discussions.
Collaboration coach	AI helps groups to research and solve problems together	Working in groups, students use ChatGPT to find out information to complete tasks and assignments.
Guide on the side	AI acts as a guide to navigate physical and conceptual spaces	Teachers use ChatGPT to generate content for classes/courses (e.g., discussion questions) and advice on how to support students in learning specific concepts.
Personal tutor	AI tutors each student and gives immediate feedback on progress	ChatGPT provides personalized feedback to students based on information provided by students or teachers (e.g., test scores).
Co-designer	AI assists throughout the design process	Teachers ask ChatGPT for ideas about designing or updating a curriculum (e.g., rubrics for assessment) and/or focus on specific goals (e.g., how to make the curriculum more accessible).
Exploratorium	AI provides tools to play with, explore and interpret data	Teachers provide basic information to students who write different queries in ChatGPT to find out more. ChatGPT can be used to support language learning.
Study buddy	AI helps the student reflect on learning material	Students explain their current level of understanding to ChatGPT and ask for ways to help them study the material. ChatGPT could also be used to help students prepare for other tasks (e.g., job interviews).
Motivator	AI offers games and challenges to extend learning	Teachers or students ask ChatGPT for ideas about how to extend students' learning after providing a summary of the current level of knowledge (e.g., quizzes, exercises).
Dynamic assessor	AI provides educators with a profile of each student's current knowledge	Students interact with ChatGPT in a tutorial-type dialogue and then ask ChatGPT to produce a summary of their current state of knowledge to share with their teacher/for assessment.

Source: UNESCO, ChatGPT and artificial intelligence in higher education: quick start guide, p. 9.

1 Sabzalieva, E and Valentini, A, 'ChatGPT and artificial intelligence in higher education: quick start guide', *UNESCO*, viewed 14 August 2024, pp. 8–9.

4.2 Many educational institutions are already using GenAI in ways identified by submitters:

- as a possibility engine to generate alternative ways of expressing an idea or rewording information, which increases accessibility for students at different learning stages
- as a Socratic opponent or debating partner to help students develop an argument, filter for bias, and refine their critical thinking skills
- as a study buddy to create or prompt questions, personalised quizzes, and reflection for students, especially as a revision tool. The artificial intelligence (AI) study buddy can also evaluate a student's understanding and retention of knowledge
- as a personal tutor for students to give them immediate feedback on their progress, helping them to identify areas for improvement. This could especially assist students from disadvantaged backgrounds if they need to improve their skills and do not have equitable access to teachers
- as a co-designer to assist in the design process. For instance, it could summarise research or concepts, and input it into lesson plans.[2]

4.3 An early adopter of GenAI in education is Pymble Ladies' College (PLC). In its submission, PLC outlined ways that GenAI could potentially support students, including as:

- ideation partner: can assist students in brainstorming ideas for projects, essays, and other assessments
- summariser: can summarise large amounts of information into digestible chunks, which aids study and revision
- synthesiser: can synthesise information across various resources and subjects, assisting with deeper understanding and cross-disciplinary learning
- translator: can assist in learning languages by providing instant translations and language practice opportunities
- research assistant: can help with researching topics by sifting through large amounts of information and presenting relevant data
- personal guide: can provide personalised learning paths, suggest resources, and guide students through complex problems based on their unique learning profiles
- reflective companion: can encourage students to reflect on their learning, identify their strengths and weaknesses, and set achievable goals for improvement

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[2] Monash University (MU), *Submission 3*, pp. 1–2; South Australia Department for Education (SA DFE), *Submission 2*, p. 4; Pymble Ladies' College (PLC), *Submission 93*, pp. 24–25, 29, 31; Maeve, Year 12 Student, The Grange P–12 College, *Committee Hansard* 13 March 2024, p. 2; Professor Mary Ryan, Executive Dean, Faculty of Education & Arts, Australian Catholic University, *Committee Hansard*, 29 January 2024, p. 6; Sabzalieva, E and Valentini, A, 'ChatGPT and artificial intelligence in higher education: quick start guide', *UNESCO*, viewed 14 August 2024, p. 9.

- accessibility aid: can support students with disabilities through features such as voice-to-text transcription, text-to-voice reading, personalised learning paths, and more
- learning style identifier: can help identify a student's learning style and suggest resources and strategies that align with that style
- skill development coach: can provide exercises and feedback to help students develop specific skills, such as critical thinking or creativity
- social-emotional learning aid: can be used about understanding and managing emotions
- time management aid: can assist students in managing their time effectively by helping to plan study schedules, reminding about deadlines[3]

4.4 One prominent use highlighted by stakeholders was the use of GenAI as a study buddy or virtual tutor for students. Online Education Services stated that GenAI tools and capabilities will revolutionise and transform the operations and practice of the Australian education sector. GenAI could improve student experience by offering 'adaptive tutors' which 'can be trained to support students using the Socratic style'.[4] The systems can identify areas where students are struggling and offer targeted assistance and foster independent learning and improvement.[5] As a virtual tutor, GenAI can:

- prompt inspiration, imagination, and creativity
- enable knowledge discovery or explore various topics
- simplify or expand challenging concepts
- present information in different ways or languages to encourage better understanding
- provide feedback and suggest ways to improve their own work[6]

4.5 The Association of Heads of Independent Schools of Australia (AHISA) conducted a survey on GenAI use in independent schools, which highlighted findings about the uses and benefits of AI. While a slender majority of its members considered it too early to tell, 43 per cent of respondents had 'identified positive gains in either student engagement or learning outcomes, or both'. The AHISA listed these gains as:

- improvements in drafting, creative inputs, brainstorming in creative work, generating ideas
- assistance for students in research
- improvements in the calibre of students' work
- greater understanding of concepts

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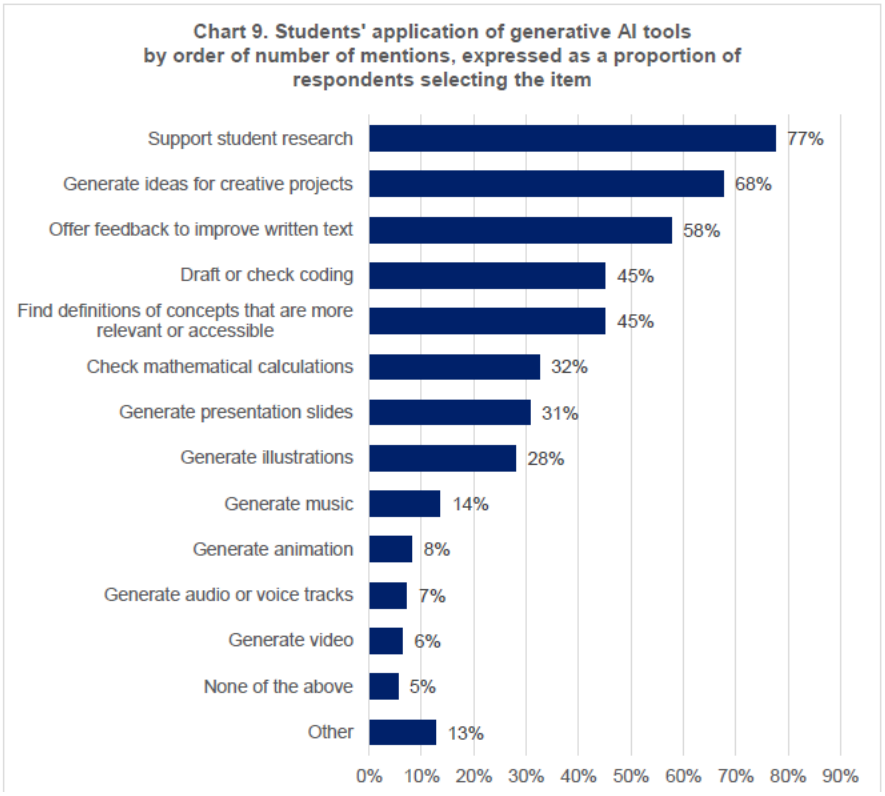
3 PLC, *Submission 93*, pp. 28–34.
4 Online Education Services (OES) *Submission 97*, pp. 1–2.
5 Association of Heads of Independent Schools of Australia (AHISA), *Submission* 82, p. 3.
6 Tech Council of Australia, *Submission* 90, pp. 2–3.

- gains for students with literacy difficulties
- improvement in student engagement.[7]

4.6 Figure 4.2 illustrates AHISA's survey results on the ways students are using GenAI.

Figure 4.2 Students' use of GenAI



Source: AHISA submission, p. 17.

4.7 The findings by AHISA highlighted that the most common uses were to support student research (77 per cent), generate ideas for creative projects (68 per cent), and offer feedback to improve written text (58 per cent). Students were less likely to use GenAI to generate video, audio, or animation.

Generating ideas and content

4.8 GenAI can generate summaries of long texts, rapidly identify relevant text, and 'perform menial tasks, such as sorting information under headings or in tables'. GenAI can therefore significantly reduce students' required study time.[8] Students are using GenAI interfaces to generate ideas for wide purposes, ranging from

7 AHISA, *Submission 82*, p. 5.
8 Australian Science and Mathematics School (ASMS), *Submission 31*, pp. 1–2.

consolidating concepts to getting answers to questions they are uncomfortable to ask their teachers.[9]

4.9 The Australian Science and Mathematics School highlighted how GenAI can assist students by generating ideas. It stated that students 'having a creative block or who are stuck on choosing an idea can generate lists of ideas', helping them to be inspired by other ideas.[10] RMIT Blockchain similarly observed that GenAI can help the author overcome their block rather than assume the role of the writer.[11]

4.10 GenAI may also assist students who struggle with, or are anxious about, their writing skills or styles of writing. The University of Sydney encouraged educators to promote students' use of GenAI in their work to 'draft some introductory lines, topic sentences, or other parts of the written work to get them started while explicitly highlighting its limitations'.[12]

4.11 Tech for Social Good (TFSG)—a youth-run organisation that helps young Australians create change through responsible technology—provided examples. For instance, a student having difficulty with a first draft of their story could 'test their ideas with ChatGPT, which can provide feedback, help draft a narrative framework and a more fleshed out draft'. TFSG claim that such an approach can assist students in testing their ideas and being more 'confident with the creative process'.[13]

Data-driven insights

4.12 GenAI can create data-driven insights and consequently administrative efficiencies at an individual and systemic level. The Committee heard that GenAI can analyse student data, providing educational institutions with valuable insights into student progress and trends.[14] This can be used by teachers and school leaders to measure real time student progress,[15] to 'understand patterns in student performance', and to 'predict student outcomes based on historical data'.[16]

4.13 The University of South Australia asserted that data can enable educators to 'identify learning gaps, and provide targeted interventions, resulting in improved student engagement and learning outcomes'.[17] The Australian Council of State School Organisations (ACSSO) stated that by analysing extensive educational data, schools can identify patterns and gaps that will allow them to make 'informed decisions and

9 Australian Academy of Technological Sciences and Engineering (AATSE), *Submission 14*, p. 2; RMIT Blockchain Innovation Hub, *Submission 18,* p. 3.
10 ASMS, *Submission 31*, pp. 1–2.
11 RMIT Blockchain Innovation Hub, *Submission 18*, p. 4.
12 The University of Sydney, *Submission 44*, Appendix B.
13 Tech for Social Good (TFSG), *Submission 32*, p. 5.
14 Cooperative Research Australia, *Submission 88*, p. 4; Australian Human Rights Commission (AHRC), *Submission 65*, p. 8.
15 Independent Schools Australia (ISA), *Submission 22*, p. 6.
16 PLC, *Submission 93*, p. 16.
17 University of South Australia (UoSA), *Submission 29*, pp. 2–3.

design targeted interventions' that will assist in curriculum development and improve educational outcomes for students.[18]

4.14 Similarly, the Amazon Web Services (AWS) explained that:

> [GenAI] can generate more comprehensive feedback and guidance to teachers based on data collected from student interactions, better predict student performance, and provide personalised learning plans… An effectively trained system can generate new insights from existing data, enabling faster and better data-driven decision making (particularly with regard to student support and learner experiences). [19]

4.15 Professor Ian Reid, Fellow at the Australian Academy of Science, stated that in using AI we 'could be analysing people's study plans, looking at their assessments and creating specific assessments or specific remedial work for students on the basis of the things that they don't understand'.[20]

4.16 Data analysis may also provide enhanced assessment methodologies. This could help to accurately evaluate student progress, streamline the assessment process, and identify additional support for students.[21] The Curtin Student Guild observed that universities can also 'analyse data from course assessments to gain insight into students learning patterns and needs and use these insights to assist students'.[22]

4.17 Researchers can use data-driven insights to guide them 'through complex ideas and methods', 'provide bespoke tutorial content', and 'imitate a peer review process from multiple perspectives'. [23] Given efficiencies like these, AWS noted that users of GenAI are already experiencing increased productivity in their learning spaces, from education businesses to front offices, staffrooms, classrooms, and at home.[24]

Personalised learning

4.18 The capacity for personalised learning through GenAI presents a unique opportunity for students to progress further on their learning journeys than ever before. The technology can assist students and teachers to focus on 'personalised instruction, guidance and mentorship'. The Tertiary Education Quality and Standards Agency (TEQSA) asserted:

> 4.1 Through intelligent algorithms and appropriate data input, individuals can access a vast array of resources, courses, and knowledge, tailored to their specific needs and interests, enabling continuous learning throughout their lives.[25]

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18 Australian Council of State School Organisations (ACSSO), *Submission 25*, p. 2.
19 Amazon Web Services (AWS), *Submission 85*, p. 3.
20 Professor Ian Reid, Fellow, Australian Academy of Science, *Committee Hansard*, 2 November 2023, p. 7.
21 ISA, *Submission 22*, p. 17; AHRC, *Submission 65*, p. 7.
22 Curtin Student Guild, *Submission* 53, p. 6.
23 RMIT Blockchain Innovation Hub, *Submission 18*, p. 4.
24 AWS, *Submission 85*, p. 3.
25 Tertiary Education Quality and Standards Agency (TEQSA), *Submission* 33, p. 7.

4.19 Students who have access to GenAI tools can ask them to explain concepts in multiple styles and build their understanding. The use of GenAI to explain concepts functions, similarly to an internet search, but is far less time-consuming, and further reduces reliance on teacher-led explanations[26]

4.20 Additionally, TFSG contended that GenAI can be used to personalise learning for students and to promote their creative and critical thinking skills. Students can use GenAI to 'generate content and interactions that are attune to student needs, adapting based on the student prompts and feedback'. This one-on-one tutoring tool can provide personalised experiences, and better engage otherwise disengaged students. Similarly, GenAI can be used a 'collaborative tool or resource bank to craft their own original pieces' through art, text, music or code, as provided in the following example:

4.2 A student struggling to understand a teacher's analysis of a Shakespeare play can turn to a tool such as ChatGPT to explain it in a different way or in simple terms, with different analogies or manners of explanation until the student finally understands.[27]

4.21 GenAI can be used to design personalised lessons which best match the student's level of knowledge. This can yield positive impacts on 'students' perceptions of their own capability' and therefore increase their motivation and engagement. The personalised features of GenAI underpin the student's experience and attainment of skills and knowledge from the course curriculum.[28]

4.22 GenAI can also provide personalised feedback to students, allowing them to progress their learning objectives. The ACSSO asserted that GenAI can 'provide instant feedback and assessment to students' and analyse and evaluate student responses on written tasks such as essays and provide constructive feedback on their weaker areas.[29] When the technology understands a student's strengths and weaknesses and learning styles, it can generate customised content and assessments for them to learn from.[30] This personalised feedback can be 'particularly powerful' for students who have struggled with traditional learning models or have additional learning needs.[31]

4.23 Professor Reid highlighted that personalised tutoring could also be especially useful where there is a teacher shortage. Professor Reid stated that personalised tutoring could be used in regional high schools where students may have very different abilities, and in the tertiary sector, for instance, as an extension tool.[32]

4.24 One example of a GenAI tool that can provide personalised feedback at scale is the Kahn Academy's Khanmigo tool.[33] This tool can personalise student learning and

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26 ASMS, *Submission* 31, p. 1.
27 TFSG, *Submission 32*, p. 5.
28 Monash DeepNeuron, *Submission* 75, p. 2.
29 ACSSO, *Submission 25*, pp. 2–3.
30 Australian Catholic University, *Submission* 68, p. 3.
31 SA DFE, *Submission* 2, pp. 3–4.
32 Professor Reid, Australian Academy of Science, *Committee Hansard*, 2 November 2023, p. 7.
33 UoSA, *Submission 29*, p. 6.

cater to each students' unique learning styles and needs. The tool does this by generating 'customised content, lessons, and assessments' that cater to a student's strengths and weaknesses.[34] The tool also analyses student data and preferred learning styles and suggests matching strategies, creates individual learning plans that address student's strengths and weaknesses, and recommends resources and activities that match a student's interests and goals.[35]

Alleviating teacher workloads

4.25 GenAI has the potential to alleviate teacher burnout by dramatically reducing administrative work and assisting with a variety of tasks.[36] GenAI can assist educators from primary education to higher education (HE) with 'lesson planning, curriculum design, diagnosis of student learning, and assessment and reporting' as well as 'grading, attendance management, and scheduling'.[37]

4.26 Independent Schools Australia asserted that GenAI tools could reduce teacher workload and increase efficiencies in the following areas:

- Identifying students who need additional support and extension, and designing intervention programs to improve student outcomes;
- Assisting in developing assessments, marking, grading, lesson planning, and generating student feedback with consistency, objectivity and fairness in grading;
- Collecting and analysing student data at scale (and low cost) and generating reports;
- Undertaking and streamlining administrative tasks such as tracking attendance, and other record keeping requirements;
- Using advanced software that can detect plagiarism;
- Determining professional learning needs and recommending resources and further learning and
- Developing a skills matrix to identify explicit skills that need to be taught to educators and students so that they can use and manage AI generated resources effectively by recognising dissonance and recognising and testing assumptions.[38]

34 ACSSO, *Submission 25*, p. 2.
35 PLC, *Submission* 93, p. 27.
36 Ms Abby Shen, Chief Operating Officer, Tech for Social Good (TFSG), *Committee Hansard*, 30 January 2024, p. 31.
37 AATSE, *Submission 14*, p. 1; ISA, *Submission 22*, p. 5; PLC, *Submission 93*, p. 26.
38 ISA, *Submission 22*, p. 6.

Administration

4.27 Teachers are, on average, working 50–60 hours per week and have limited time for direct, face-to-face instruction. Access to GenAI tools is currently free and can assist teachers. The uptake of GenAI by teachers has been strong and has helped alleviate teacher workload.[39] The Australian Education Union claimed that GenAI can reduce some teacher responsibilities, which may alleviate teacher shortages and workloads, freeing up time for more direct student engagement.[40]

4.28 Similarly, Tech Council of Australia asserted that if it is properly managed, GenAI has the potential to:

4.3 'streamline time-consuming administrative tasks for educators to free up time and attention to dedicate to the most impactful and meaningful aspects of teaching [and] support educators to identify and adopt best-practice teaching approaches'.[41]

4.29 The use of GenAI to perform administrative tasks can benefit researchers through the collection, processing and analysis of data. GenAI can also assist with time consuming administrative and reporting processes, which could give them more time to conduct research.[42]

4.30 In school administration, GenAI is being used to rewrite text to increase its accessibility, generate question variations, build lesson plans that integrate online content, and increase marking and feedback efficiencies.[43] As such, it can create learning resources and develop answers, and map activities to core curriculum outcomes and education prompts.[44]

4.31 The South Australian Department for Education (SA DFE) contended that GenAI can automate a variety of education administration tasks including 'generating reports, creating content and marketing materials such as email campaigns and social media posts, creating presentations, generating ideas, and helping with brainstorming'.[45] The SA DFE conducted a trial of EdChat to understand how it can be rolled out in classrooms, and noted that:

4.4 There was a sense that there is a need for training and professional learning to support the use of generative AI and to help understand its potential. That was flagged in phase 1 of the trial. It was used across various curriculum areas. It was used for lesson planning. It was also used as per the example I referred to earlier; it performed strongly in differentiating learning for students. Teachers, in particular, generally found that it enhanced task efficiency, which is aligned with the work we are doing in South

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39 Professor Leslie Loble AM, UTS, Industry Professor, University of Technology Sydney (UTS), *Committee Hansard*, 6 September 2023, p. 12.

40 Mr Kevin Bates, Federal Secretary, Australian Education Union, *Committee Hansard*, 2 November 2023, p. 2; Professor Loble, UTS, *Submission 49*, p. 1.

41 Tech Council of Australia, *Submission 90*, p. 2.

42 National Tertiary Education Union (NTEU), *Submission 52*, p. 2.

43 Australian Secondary Principals' Association (ASPA), *Submission 8*, p. 3.

44 Tech Council of Australia, *Submission 90*, p. 2.

45 SA DFE, *Submission 2*, pp. 4–5.

Australia to try and reduce administrative burdens for teachers and enable greater time for teaching. It supported that objective.[46]

4.32 As Australian teachers are facing ever increasing workloads and complex tasks, there are several positive consequences of GenAI for teachers. By reducing teacher's workload, GenAI may allow 'more time to spend facilitating learning and helping students to develop their critical thinking, creativity, interpersonal, and metacognitive skills'.[47] GenAI may also help provide learning interventions to support students where it is needed.[48] The automation of tasks and subsequently efficient operational systems can increase the productivity of school administrators and principals alike, but may require more research.[49]

4.33 The Victorian Association for the Teaching of English (VATE) reported to the Committee that GenAI can assist a teacher in their daily work by offloading and reducing their workload.[50] This raises questions about whether teachers should be undertaking tasks that can be automated by GenAI, whether the task should exist at all or if it could be done in a different way. VATE gave the example of report writing. While it can be a very onerous process, instead of offloading report writing to GenAI, education administrators could rethink the way reports are written.[51]

4.34 Reducing the administrative burden teachers and administrators face may particularly benefit schools in low socio-economic communities, where there is a higher administrative burden. The Committee heard more support is needed for families in areas of 'poverty and trauma'.[52] One response could be to provide GenAI resources in these communities to help manage these issues.

4.35 The Australian Secondary Principals' Association stressed the importance of providing the appropriate time and professional development opportunities for teachers to adapt to their practice to the changing curriculum. When teachers are confident and proficient in their own capabilities, they will be better placed to support students to learn technology.[53]

Lesson planning

4.36 GenAI can be used to generate educational content including lesson plans, study materials, interactive activities, and to provide topic content for their students' year level and learning style.[54] The SA DFE contended that GenAI can be used by

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46 Ms Julia Oakley, Executive Director, System Performance, South Australia Department for Education, *Committee Hansard*, 5 February 2024, p. 3.
47 ASPA, *Submission 8*, p. 3.
48 ISA, *Submission 22*, p. 6.
49 ASPA, *Submission 8*, p. 3.
50 Mr Leon Furze, Council Member, Victorian Association for the Teaching of English (VATE), *Committee Hansard*, 15 November 2023, pp. 10–11.
51 Mr Furze, VATE, *Committee Hansard*, 15 November 2023, p. 10.
52 Associate Professor Joanne O'Mara, President, Victorian Association for the Teaching of English, *Committee Hansard* 15 November 2023, p. 11.
53 ASPA, *Submission 8*, p. 3
54 ISA, *Submission 22*, p. 6.

educators ‘as a starting point for lesson planning’ where teachers can input the lesson objectives and other parameters and then use the platforms output as ideas for lesson design and activities.[55]

4.37 Dr James Curran, Chief Executive Officer of Grok Academy, comments on the use of AI-generated lesson plans in schools:

4.5 We've got a situation where the vast majority of our teachers are individually reinventing the wheel every night and every weekend, trying to find resources and activities. For example, in digital technologies they may have very little expertise themselves in the curriculum and therefore also not a great ability to differentiate between a quality resource and activity and something that is—let's say there are better opportunities out there. As a result, they're turning to ChatGPT, putting in a content description from the Australian curriculum and saying, 'Write me a lesson plan for this,' because we never gave them a lesson plan in the first place.[56]

4.38 The Committee heard that in many cases lessons plans that are designed using GenAI, especially for complex subjects like digital technologies, are incorrect. Dr Curran described such a situation:

4.6 We did an example at a workshop last week. We said, 'Put in this content description from digital technologies,' and it actually came up for an activity that was unrelated to that particular content description. Mostly, teachers would not have the expertise to necessarily be able to tell that that was the case.[57]

4.39 Using GenAI to write lesson plans is becoming a common occurrence, especially in HE where there is space to experiment and develop new forms of pedagogy. Universities have held training and discussions on how to incorporate course work in more reflective, interesting, and engaging ways, particularly for technical subject matter.[58]

4.40 In conjunction with lesson planning, GenAI can be used to support curriculum design. GenAI can ‘create logical sequences of learning to align syllabuses and school contexts’ and act as a type of reflective practice for teachers by ‘analysing their own teaching methods through live video capture and AI feedback’ through educational technology (EdTech) tools.[59] Professor Leslie Loble AM, Industry Professor at the University of Technology Sydney (UTS), asserted that ‘smart’ curriculum tools use AI to bring evidence-based and ‘proven in practice’ resources directly to teachers for lesson planning’. GenAI tools that are built on ‘evidence-based pedagogy and teacher-focused support’ can provide better access to quality materials that ‘connect to required learning content and to data informed student insights’.[60]

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55 SA DFE, *Submission 2*, p. 4.
56 Dr James Curran, Chief Executive Officer, Grok Academy, *Committee Hansard*, 6 September 2023, p. 13.
57 Dr Curran, Grok Academy, *Committee Hansard*, 6 September 2023, p. 13.
58 Professor Nicholas Davis, Industry Professor of Emerging Technology and Co-Director, Human Technology Institute, University of Technology Sydney (UTS), *Committee Hansard*, 6 September 2023, p. 10.
59 ISA, *Submission 22*, pp. 5–6.
60 Professor Loble, UTS, *Submission 49*, p. 2.

Grading

4.41 The Productivity Commission found that 'for every four hours a schoolteacher spends teaching, they spend one hour marking'. Furthermore, HE markers can be paid 'piece rates that understate the time taken to mark assessments'.[61]

4.42 The University of Melbourne summarised the opportunities and of using GenAI for grading:

> 4.7 For example, while using automated marking (a form of AI) to provide students with rapid feedback on a low stakes multiple choice quiz might be appropriate, efficient and useful, using generative AI or automation to provide feedback on all formative assessments would likely be detrimental for students. This is because it eliminates one of the few personalised and relational interactions that students have with their teachers as well as a valuable opportunity for teachers to monitor and support student learning, their learning development, and their improvements over time. It may also embed biases, particularly where it is used to provide feedback on more subjective forms of assessment. Further, automated marking technologies operate by recognising norms and may mark down work that is unusual, meaning that they can fail exceptional work.[62]

4.43 The Committee heard that using GenAI to grade students' assignments could save time for teachers, allowing them to redirect their focus on other aspects of teaching. GenAI-powered grading systems can 'quickly evaluate multiple assignments and provide feedback' to students.[63] Grading using GenAI can be readily adopted to yes/no or multiple-choice questions as a means 'to implement the assessment, generate marks, and provide feedback at scale and in a reasonable timeframe'.[64] The technology can assist teachers to provide more detailed and useful feedback on assessments, and 'provide an enhanced education experience for students'.[65]

4.44 The Queensland University of Technology (QUT) asserted that if GenAI can be implemented to mark different types of assessments at scale, it would allow universities to consider other approaches to assessment that would better represent student learning. QUT stated that universities can be slow to change and therefore, policies need to be flexible and adaptive as the technology changes.[66]

4.45 The University of Sydney provided an example of how ChatGPT could be used to design and draft a marking rubric. A marking rubric is a table that helps students and assessors understand the expectations of the assignment and how a student will be marked against the assessment criteria. A good rubric will reduce teacher workload and better engage the students with the feedback they will receive. A rubric can be difficult to write from scratch and a GenAI tool can be used to generate a rubric that the assessor can finesse. The University of Sydney provided the following example prompt:

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61 AATSE, *Submission 14*, p. 3.
62 The University of Melbourne, *Submission 34*, p. 10.
63 Name Withheld, *Submission 12*, p. 1.
64 Queensland University of Technology (QUT), *Submission 57*, p. 4.
65 AATSE, *Submission 14*, p. 3.
66 QUT, *Submission 57*, p. 4.

4.8 Design a marking rubric for a postgraduate assessment that asks students to apply their knowledge of the global financial crisis to a more contemporary economic challenge. The rubric needs to assess students on their use of literature, their analysis of the underlying causes of the GFC, and apply it creatively to a contemporary challenge. Please provide standards for each criterion from high distinction, distinction, credit, pass, and fail.[67]

4.46 Several submissions, however, raised concerns about the use of GenAI in grading student work. The Committee heard that using GenAI for grading is one of the higher-risk aspects of its application. It has ramifications not only for students undertaking assessments in schools and universities, but for situations when grading may affect admission to educational institutions in the first place.[68]

4.47 TEQSA contended that there is a risk of GenAI systems 'becoming self-contained and self-referential'. If a student uses GenAI to complete an assessment and an educator uses GenAI to grade the assessment, then the 'limited human involvement in the process undermines not just the educational experience but the very process of learning'.[69] There is a further risk that in using GenAI to grade assessments, it will punish 'out of the box' and creative thinking, where only a narrow set of answers is considered 'correct' by the platform.[70]

4.48 The Federation of Parents and Citizens Associations of New South Wales (FPCA NSW) argued that GenAI would be incapable of assessing qualitative and substantive written work. Students could be awarded high marks for 'writing random gibberish' if they used 'sophisticated vocabulary and sentence structure'.[71] GenAI could be useful though for marking where there are definitive right and wrong answers, but it must always be verified by a person.[72] The University of New South Wales (UNSW) states that educational institutions will need to consider where human review and feedback would be required, and under which circumstances a student could challenge a GenAI marked assessment for human review.[73] The National Tertiary Education Union (NTEU) was concerned about accountability for decisions taken by a GenAI tool, which can affect the appeal processes.[74]

4.49 The FPCA NSW and the Centre for Digital Wellbeing (CDW) referenced the dangers of using GenAI for grading, citing the following example. Due to the COVID-19 pandemic, in 2020 the United Kingdom (UK) Government did not allow A-level exams to proceed; instead, grades were determined by an algorithm. Teachers were asked to provide an estimate of the results they expected the students to receive, and the estimations were weighted against the historic performance of individual secondary schools using an algorithm. Nearly 40 per cent of students had their grades lowered by the algorithm, with a higher representation of students coming from disadvantaged

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67 The University of Sydney, *Submission 44*, *Appendix B*, p. [14].
68 Dr Jose-Miguel Bello y Villarino, Senior Research Fellow, ARC Centre of Excellence for Automatic Decision-Making and Society, The University of Sydney*, Committee Hansard*, 30 January 2024, p. 17.
69 TEQSA, *Submission* 33, p. 6.
70 Centre for Digital Wellbeing (CDW), *Submission 83*, p. 5.
71 Federation of Parents and Citizens Associations New South Wales (FPCA NSW), *Submission 43*, p. 4.
72 FPCA NSW, *Submission 43*, p. 5.
73 University of New South Wales (UNSW), *Submission 76*, p. 4.
74 NTEU, *Submission 52*, pp. 6–7.

schools, while students from more affluent schools had a higher likelihood of increased grades.[75] As the exam scores are the main criterion for entry into HE in the UK, the algorithm generated results were retracted.[76]

4.50 VATE submitted that teachers' professional judgement in grading may be questioned, and AI can conversely attribute higher grades to students. VATE reported a parent challenging their child's School-Assessed Coursework (SAC) score because when entering the SAC content into ChatGPT with a prompt request for a score, the SAC scored higher in ChatGPT. This led the parent to believe that their child had been harshly graded by the teacher.[77]

Balancing risks

4.51 There are risks that the introduction of GenAI may actually increase the workload of teachers rather than reduce it. General teacher workload remains a serious concern with 75 per cent of Australian teachers reporting that their workload is unmanageable.[78] The Independent Education Union of Australia (IEUA) argued that the adoption of GenAI needs to be viewed through the lens of the current teacher shortage.[79]

4.52 Teachers will need to learn how to use GenAI and assist students with it. There are concerns that the pace of development of these tools may outstrip the capacity for educators to keep up. GenAI may place 'significant demands on educator time, from understanding the operations and functionality, to fully engaging with ethical and creative considerations of the tools available'.[80]

4.53 Some teachers are also concerned that their workloads will increase regarding GenAI and assessments. For example, teachers may need to run AI-detection software, fulfil authentication requirements, and double mark work to ensure education outcomes.[81]

4.54 The NTEU advised of instances where university administrations have reduced resourcing for administrative work under the guise that it can be done through Microsoft Copilot. This has not led to an improvement in productivity, rather there has been an increase in workload for teaching staff and a reduction in time spent on teaching tasks.[82]

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75 FPCA NSW, *Submission 43*, pp. 4–5; CDW, *Submission 83*, p. 11.
76 FPCA NSW, *Submission 43*, pp. 4–5.
77 Victorian Association for the Teaching of English (VATE), *Submission 10*, p. 9.
78 Tech Council of Australia, *Submission 90*, p. 4.
79 Mr Brad Hayes, Federal Secretary, Independent Education Union of Australia (IEUA), *Committee Hansard,* 11 October 2023, p. 5.
80 ISA, *Submission 22*, p. 28.
81 VATE, *Submission 10*, p. 11; Mr Hayes, IEUA, *Committee Hansard,* 11 October 2023, p. 6.
82 NTEU, *Submission 51*, p. 5.

4.55 Teachers will require adequate training to support and adapt to the use of GenAI in the classroom through pedagogical support, technical support and legal and ethical support.[83] This is discussed more fully in Chapter 5.

Opportunities to bridge the digital divide

Access and equity challenges

4.56 The digital divide presents a barrier to education equality with disadvantaged students and schools struggling to access the same digital learning opportunities as their more privileged counterparts.[84] Many stakeholders raised possible impacts of GenAI in education as they relate to equity. Whilst GenAI has transformative capacity and the ability to improve educational outcomes, it is imperative that there are equitable opportunities for all students, regardless of their background.[85]

4.57 Australia has a significant digital divide, with one in four people being identified as 'digitally excluded.' Digital exclusion is 'driven by lack of access, affordability, and digital skills.'[86] TFSG stated in its submission that Australia has one of the most inequitable education systems, ranking in the bottom-third of Organisation for Economic Co-operation and Development (OECD) countries in providing equitable access to education.[87]

4.58 The digital divide is demonstrated in the Australian Digital Inclusion Index. The Australian Human Rights Commission (AHRC) wrote in its submission:

> The 2021 Australian Digital Inclusion Index shows that there remains a substantial digital divide in Australia. One in four people in Australia were identified as being 'digitally excluded' and 'people with low levels or income, education and employment, those living in some regional areas, people aged over 65 and people with a disability' being identified as being of particular risk of being left behind.[88]

4.59 The digital divide presents itself 'in terms of really simple, basic technologies such as computer access, internet connectivity and data usage'.[89] This is particularly important, as 'generative AI requires significant digital literacy to know how to 'converse' with the tool, how to best prompt and interrogate, and, most importantly, how to evaluate and interpret the responses'.[90]

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83 ISA, *Submission 22*, p. 9.
84 Professor Loble, UTS, *Submission 49*, p. 4.
85 AHRC, *Submission 65*, p. 14.
86 Professor Loble, UTS, *Submission 49*, p. 4.
87 TFSG, *Submission 32*, p. 3.
88 AHRC*, Submission 65*, pp. 14–15.
89 Ms Shen, TFSG, *Committee Hansard*, 30 January 2024. p. 32.
90 Professor Loble, UTS, *Submission 49*, p. 4.

4.60 The digital divide is perhaps most keenly felt in low socio-economic communities, as teaching 'institutions may have limited access to essential infrastructure to use digital technologies, such as fast internet, and may have less budget to purchase new technologies for the classroom'.[91]

4.61 The costs associated with GenAI will create barriers for some students from disadvantaged backgrounds to use the technology at school and at home. Teachers are currently trying to support students 'who reside in tents and caravans without electricity and only a packet of chips for dinner, making learning with AI technology impossible outside of school.'[92]

4.62 Children from The Grange P–12 College in Victoria need to bring their own devices to school to use for classes and log into the school's cloud.[93] Teachers from The Grange P–12 College also reported that prior to the COVID-19 pandemic, the school had a one-to-one netbook per student program at its primary school campus; however, it can no longer run the program due to funding changes. The school now has laptop trolleys for one laptop to be shared between two students.[94]

4.63 This can be contrasted to many private schools, which have immediate physical access not only to GenAI tools, but also robotics and coding technology.[95] PLC has already begun integrating GenAI into their curriculum, where they teach science, technology, engineering and mathematics (STEM) subjects from a young age and the students undertake digital technologies and data science courses where the use of GenAI is permitted.[96]

4.64 Students are aware of this divide, with one from The Grange P–12 College stating:

> 4.9 I think—you already have a very noticeable divide between public and private, east and west, under-represented and very prominent schools in Victoria and Australia. By not including those disadvantaged schools you're making them—it's as if you're just acknowledging they don't exist.[97]

Regional and remote communities

4.65 There is also some concern that educators in regional, rural, and remote communities may have less access to professional learning opportunities, which may impact the capacity to support digital learning in schools.[98] In fact, the Grattan

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91 Department of Education (DoE), *Submission 48*, p. 6.
92 Professor Loble, UTS, *Supplementary Submission 49.1*, p. 2.
93 Rubeina, Year 12 Student, The Grange P-12 College, *Committee Hansard*, 13 March 2024, p. 2.
94 Ms Teagan Snowling, Learning Specialist, STEM, The Grange P–12 College, *Committee Hansard*, 13 March 2024, p 9.
95 Mrs Kristen Migliorini, Founder and Chief Executive Officer, KomplyAi, *Committee Hansard*, 29 January 2024, p. 21.
96 Mr Anthony England, Director, Innovative Learning Technologies, PLC*, Committee Hansard*, 29 January 2024, pp. 1–3.
97 Rubeina, Year 12 Student, The Grange P–12 School, *Committee Hansard*, 13 March 2024, p. 5.
98 University of Technology Sydney Centre for Research on Education in a Digital Society, *Submission 19*, p. 14.

Institute has found that students living in regional and rural areas are two years behind their inner-city counterparts who attend more advantaged schools.[99]

4.66 This sentiment has been echoed by the Northern Territory (NT) Government and Charles Darwin University. The NT Government stated:

> 4.10 Many NT students do not have access to basic reliable technology and the ability to consistently connect to the internet remains a priority with the digital divide further disadvantaging a significant number of NT students. Innovative technology, such as generative AI, has a dependency on connectivity and digital capability of students and staff.[100]

4.67 This is supported by a Charles Darwin University survey, which found that eight per cent of respondents in the NT were already experiencing disadvantage because they could not access the benefits of GenAI, with a further 15 per cent foreseeing disadvantage.[101]

Access and resources

4.68 Failure to address digital equity and the use of GenAI may perpetuate the digital divide in education, and Australian society more broadly. The AHRC have expressed concern that the students who stand to benefit the most form these technologies are also the most technologically disadvantaged, and least likely to gain access to it.[102] There are significant barriers to closing the digital divide including skills accrual, cost and policy application.

4.69 As GenAI is integrated into Australian schools and society, the skills needed to succeed in school and at university will change. Lack of access to the same level of technology may have long-term negative consequences on students' outcomes.[103] This is because addressing the digital divide requires both electronic devices and internet access, and access to high quality learning applications. The schools and families able to access the best EdTech assets will have better long-term learning outcomes, adding to their already significant advantage.[104]

4.70 An additional barrier to access is the level of knowledge that will be required to access different GenAI platforms and the ability to teach students as the technology evolves over time and becomes embedded in EdTech.

4.71 Cost is perhaps the biggest and most important aspect of closing the digital divide with some cohorts struggling to access existing technology, let alone emerging technology.[105] Data scientists are charging corporation hundreds and thousands of

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99 TFSG, *Submission 32*, p. 3.
100 Northern Territory Department of Education, *Submission 66*, p. 1.
101 Charles Darwin University, *Submission 73*, p. 6.
102 Mrs Lorraine Finlay, Human Rights Commissioner, Australian Human Rights Commission (AHRC), *Committee Hansard*, 4 October 2023, p. 17.
103 DoE, *Submission 48*, p. 7.
104 Professor Loble, UTS, *Submission 49,* p. 4.
105 NTEU, *Submission 52*, p. 6.

dollars per hour to engage in responsible AI.[106] Disadvantaged communities may lack the 'necessary infrastructure and resources required to access, implement and maintain relevant education technologies'. This is because of the likelihood that superior and more sophisticated versions of GenAI will be more expensive leading to accountability and quality control issues that may further disadvantage some communities.[107] Schools vary in their capacity to pay for the additional features built into paid content, which may further exacerbate the digital divide.[108]

4.72 The digital divide is also exacerbated by the subscription-based business model that underpins AI-enabled EdTech.[109] GenAI platforms such as ChatGPT require a paid monthly subscription,[110] with a single account costing $240 per annum which may severely stretch the budgets of disadvantaged families and schools. Without equitable pricing arrangements for schools, it would cost $250,000 annually for a school of 1,000 students to use GenAI, which is approximately equates to three new teachers.[111] UNSW further added that if EdTech vendors 'insist on a pay-per-use licencing system, it will be difficult for students and universities to properly budget for GenAI use'.[112] Professor Loble also expressed concerns that reduced cost or free versions may expose students to advertisements or weaker learning features.[113]

4.73 Students and families without internet access, devices, or knowledge and capacity will be unable to fully leverage and realise the benefits of GenAI without support. In its submission, the National Catholic Education Commission documented a recent government initiative:

> 4.11 A recent example is the Broadband initiative led by the NBN, which aimed to supply 30,000 broadband connections to disadvantaged families. This target was not met due to a number of factors, including perceptions of disadvantaged families and an over-rigorous application process.[114]

4.74 Resourcing disparities not only between schools, but also by State and Territory may further exacerbate the digital divide. The University of Sydney argues that the divide could widen because 'access to and familiarisation with GenAI, because of resourcing disparities between schools and inconsistent policies pursued by different states and school systems regarding the technology'.[115] The AHRC further claim that any framework requires 'national consistency', there is also a need to recognise 'simple access to the technology… and differences in the ability of particular groups to engage with the technology'.[116] The main danger posed is that students from more

106 Mrs Migliorini, KomplyAi, *Committee Hansard*, 29 January 2024, p. 21.
107 ISA, *Submission 22*, p. 10.
108 IEUA, *Submission 26*, p. 5.
109 Professor Loble, UTS, *Submission 49*, p. 4.
110 NTEU, *Submission 52*, p. 6.
111 Professor Loble, UTS, *Submission 49*, pp. 4-5.
112 UNSW, *Submission 76*, p. 5.
113 Professor Loble, UTS, *Submission 49*, p. 4.
114 National Catholic Education Commission, *Submission 81*, p. 6.
115 The University of Sydney, *Submission 44*, p. 7.
116 Mrs Finlay, AHRC, *Committee Hansard*, 4 October 2023, p. 17.

educated and affluent backgrounds will have access to much more powerful applications.[117]

4.75 Banning the use of GenAI technology may further intensify the digital divide. Bans will not protect students or teachers from the harms of GenAI; rather, independent schools will embrace GenAI in supervised, controlled settings, leaving public and poorer schools to lag behind.[118] It may perpetuate the already existing digital divide between those who know how to use GenAI and those who do not[119]

Bridging the divide

4.76 Although there are significant risks with GenAI exacerbating the digital divide, the technology may also help close it. GenAI can be beneficial to international students, help in the democratisation of knowledge, improve access for low socio-economic students, and help build long-term digital capacity. GenAI may help bridge the digital divide for international students. UNSW asserts that the ability for international students to use GenAI as study buddy will help them to check and edit their work before submission, 'enabling their ideas to be judged rather than their English or grammar skills'.[120]

4.77 GenAI tools have the capacity to improve student learning outcomes and helped disadvantaged students, provided that the platforms are 'well-designed, well-used and well-governed'. The technology has the ability to increase the accessibility of high-quality education, thereby democratising the knowledge and empowering disadvantaged students to reach their full potential.[121]

4.78 Similarly, GenAI has the potential to be transformative for disadvantaged students from low socio-economic backgrounds. By providing equal access to educational resources such as online libraries educational material and digital resources through GenAI platforms, students can have access to high quality educational content regardless of their socio-economic status, which may contribute to their long-term success.[122]

4.79 ACSSO also contends that building the digital capacity and literacy of students from disadvantaged backgrounds is critical to their future success. The ACSSO asserts that '[i]nteractive platforms and virtual environments powered by AI could facilitate digital skills development.' GenAI can provide coding platforms, AI programming courses and simulations that will equip students to excel in the digital era.[123]

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117 The University of Sydney, *Submission 44*, p. 7.
118 TFSG, *Submission 32*, p. 4.
119 AHRC*, Submission 65*, p. 12.
120 UNSW, *Submission 76*, p. 5.
121 ISA, *Submission 22*, p. 11.
122 ACSSO, *Submission 25*, p. 25.
123 ACSSO, *Submission 25*, p. 25.

4.80 Stakeholders identified several ways to bridge the digital divide. These include investment and building sufficient communications infrastructure, strong standards, and good AI governance, and capacity for students and teachers.

- Investment: The GenAI market can be shaped through investment in affordable, high-quality tools that benefit disadvantaged and special needs students. There needs to be targeted resourcing for disadvantaged students and schools as well as resourcing for public schools to provide access to GenAI technology to their students.[124] The AHRC also recommends ensuring that digital technology is available for use in community facilities such as libraries to better the digital divide.[125] Moreover, UNSW recommends that GenAI vendors are encouraged to 'enter into institutional licences with universities that have unlimited use for staff and students' to ensure consistent access to similar GenAI platforms.[126] It may also be pertinent to develop a needs-based funding model to roll out GenAI to all schools that want the technology.[127]
- Telecommunications infrastructure: The IEUA said '[s]ecuring reliable internet connection and appropriate infrastructure across Australia' will help prevent the perpetuation of inequality in Australia's education system.[128] Professor Loble recommended to '[u]tilise existing funding and regulatory leverage in the communications sector to expand access to affordable and high-capacity internet' as:

  > Much of the leverage to address the digital divide will reside outside of education, for example within communications policy and investments, and those levers need to be pulled more firmly by government to overcome this basic access challenge….[129]

- Standards and Governance: It is important to ensure that EdTech quality standards incorporate inclusive design and governance processes and that they are adhered to.[130] CDW cautions that educational institutions should not drop their standards in order to 'push technology into lower socioeconomic schools faster so as to be able to move that gap as this may create another layer of long-term digital disadvantage'.[131]
- Encouraging good decision-making: Schools often know what works best for them. Public schools are unlikely to ask for millions of dollars; rather, they seek the resources that are similar to those of the school down the road and also what's available at independent schools.[132] Conversely, Professor Loble

124 Professor Loble, UTS, *Submission 49*, pp. 4–5.
125 AHRC*, Submission 65*, p. 14.
126 UNSW, *Submission 76*, p. 5.
127 Ms Shen, TFSG, *Committee Hansard*, 30 January 2024, pp. 32–33.
128 IEUA, *Submission 26*, p. 6.
129 Professor Loble, UTS, *Supplementary Submission 49.1*, p. 3.
130 Professor Loble, UTS, *Submission 49*, pp. 4–5.
131 CDW, *Committee Hansard*, 4 October 2023, pp. 5–7.
132 Mr David Smillie, College Principal, The Grange P–12 College, *Committee Hansard*, 13 March 2024, p. 18.

encourages good decision making in the purchasing of GenAI EdTech to ensure the technology is not only used, but also levels the playing field.[133]

- Capacity building: Professor Loble stresses that it is crucial to build the capacity for teacher and students to use these tools to lower the five-year learning divide between high and low socio-economic communities. It's not just about access to the tools, but rather having the internet access and the skills and capabilities to use them.[134] It may be pertinent to 'build philanthropic and other partnerships to connect digital assets—physical as well as skills and expertise—with disadvantaged schools and students.'[135]

4.81 GenAI could potentially support students from diverse backgrounds by improving their access to education and their learning experience.[136] Various submissions highlighted that GenAI could assist various student cohorts, noting that more research is required to form a strong evidence base. This includes students:

- with a disability or learning difficulty who 'require different approaches to learning in order to thrive'
- with English as a second language (ESL)
- from low socio-economic backgrounds who are experiencing equity and access issues
- living in remote or regional areas, including Aboriginal and Torres Strait Islander students
- mature age students who are often time-poor and seek to upskill.[137]

Students with disabilities or learning difficulties

4.82 The Committee received evidence about how AI-based personalised learning can assist students with disabilities or learning difficulties. For example, GenAI can enable adaptive and flexible learning environments that can accommodate students with varied challenges, such as dyslexia, dysgraphia, dyscalculia, dyspraxia, auditory processing disorder, developmental language disorder, autism spectrum disorder (ASD), or attention deficit hyperactive disorder (ADHD). For these students GenAI can provide tailored instructions and feedback that suits individual needs, preferences, and pace, and foster engagement and motivation.

4.83 More specifically, GenAI can benefit students with a disability through 'assistive technology such as speech-to-text or text-to-speech tools…language translation tools…[and] virtual teaching assistants'.[138] Speech-to-text technology has the capacity to greatly assist accessibility for students with hearing impairments, while text-to-speech technology can assist students with vision impairments and may

133 Professor Loble, UTS, *Committee Hansard*, 20 March 2024, p. 9.
134 Professor Loble, UTS, *Committee Hansard*, 20 March 2024, p. 9.
135 Professor Loble, UTS, *Supplementary Submission 49.1*, p. 3.
136 NTEU, *Submission 52*, p. 2.
137 OES, *Submission 97*, p. 2; Tech Council of Australia, *Submission* 90, p. 3.
138 AHRC, *Submission* 65, p. 7.

assist students with other reading difficulties.[139] GenAI may assist in the development of personalised learning plans and help students with a disability to better receive instructions from adaptive AI-driven tutors, which can help improve their overall engagement and learning outcomes.[140]

4.84 The Curtin Student Guild explained that GenAI can assist students with disabilities and remove accessibility barriers:

> - Image recognition can be used to create visual representations allowing visually impaired, autistic individuals or students with visual learning preferences to get a better understanding of the material;
> - Brainstorming applications can assist students with ADHD to identify and structure their ideas…
> - Lip reading, enhanced feedback, captioning, virtual reality and hybrid and online learning are other AI functions that can remove accessibility barriers.[141]

4.85 GenAI can have a strong impact on teaching and assessment, particularly for neurodiverse students. Charles Darwin University stated that GenAI will support neurodiverse students who may be very creative but struggle to adequately express their thoughts in writing.[142] This can be achieved by providing personalised and adaptive learning experiences, tailored interventions, and data analysis for individuals with ASD.[143] The SA DFE's trial of GenAI has yielded such benefits. The SA DFE noted:

> 4.12 The teacher set a task for the student. The student had autism spectrum disorder. They were able to use EdChat to reframe the task, in terms that were much better for the student, and also translate the task into the student's first language. It highlighted for both teacher and student that, in a matter of seconds, a task could be adapted for a student who otherwise would have had significant challenges with their learning. There were incredibly positive results.[144]

4.86 PLC agreed that personalised learning paths can accommodate a student's specific needs and abilities, but acknowledged that these technologies are constrained by their inability to provide the emotional or social support needed by some students with disabilities. PLC warned that an over-reliance on AI might make at risk students less self-reliant or hinder their ability to develop coping mechanisms.[145]

ESL students

4.87 UNSW highlighted that GenAI tools can be used by students to translate information. For example, Microsoft Azure's OpenAI can translate over 125 languages through

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139 PLC, *Submission 93*, p. 32; ACSSO, *Submission 25*, p. 3.
140 OES, *Submission 97*, p. 4.
141 Curtin Student Guild, Submission 53, p. 6.
142 Charles Darwin University, *Submission 73*, p. 5.
143 ISA, *Submission 22*, p. 17.
144 Ms Oakley, SA DFE, *Committee Hansard*, 5 February 2024, p. 2.
145 PLC, *Submission 93*, p. 17, p. 32.

the Microsoft Translator Plugin.[146] GenAI can assist by translating or correcting assessment tasks for students for whom English is not their primary language,[147] and make a wider range of web-based information available to them. This could enhance learning for student cohorts like international students, refugees, migrants, and people raised in Australia with a primary language other than English.[148]

4.88 Professor Allie Clemans, Acting Deputy Vice-Chancellor of Education at Monash University, commented that international students were using GenAI to teach themselves and consolidate educational content rather than to complete assessments as had been assumed. However, Professor Clemans also noted that students would be less inclined to self-report if they were using GenAI to complete assessments.[149] Similarly, Professor Nicholas Davis, Industry Professor of Emerging Technology and Co-Director of the Human Technology Institute at UTS said:

> I see students with English as a second language using this, by second nature, to help them comprehend concepts and translate backwards and forwards on the fly and to give explanations of why the lecturer might have said that word. I see this at the university level, but I also hear stories from my friends and colleagues working in secondary school systems.[150]

4.89 UNSW highlighted equity considerations and how AI may be used to 'level the playing field' for international students who can use it to check and edit their work. AI would enable 'their ideas to be judged rather than their English or grammar skills'. There is much to be said for permitting this practice 'given the significance of Australia's international student population and global educational reach'.[151]

4.90 While PLC acknowledged the constraints of artificial intelligence in translating cultural nuance and the potential for over-reliance on translations by some students, PLC highlighted how AI can 'facilitate language practice by conversing with students' and provide 'cultural context and idiomatic usage of words' for learners.[152]

4.91 The Australian Library and Information Association highlighted that ESL students are likely to feel the greatest benefits of GenAI. AI powered translation, grammar, style, and spelling tools are already used to support understanding, expression, and language acquisition. Many of these students do not have assistance at home with learning language skills, and GenAI tools can assist.[153]

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146 Tech Council of Australia, *Submission 90*, p. 3.
147 UNSW, *Submission 76*, p. 2.
148 Tech Council of Australia, *Submission 90*, p. 3.
149 Professor Allie Clemans, Acting Deputy Vice-Chancellor, Education, Monash University, *Committee Hansard*, 9 November 2023, p. 4.
150 Professor Davis, UTS, *Committee Hansard*, 6 September 2023, p. 10.
151 UNSW, *Submission 76*, p. 2.
152 PLC, *Submission 93*, pp. 31–37.
153 Australian Library and Information Association, *Submission 51*, p. 4.

Low socio-economic communities

4.92 Several stakeholders argued that GenAI can benefit students in low socio-economic communities. The OECD has found a link between socio-economic disadvantage and low academic performance.[154] Some challenges include that students may not have access to fast internet at home, which is compounded by Australia's cost of living issues. This can particularly affect children in out-of-home care.[155] The Committee heard that 20 per cent of students in Australia in low socio-economic schools also lack access to adequate curriculum support and instructional materials.[156] Given 'historical challenges with equitable resource allocation', TEQSA recommended a needs-based distribution of GenAI with the necessary infrastructure and training to accompany it.[157]

4.93 The introduction of GenAI to the classroom stands to benefit low socio-economic students through the introduction of 'easy, accessible, affordable and safe' materials for student use.[158] The Australasian Academic Integrity Network claimed that GenAI can be used to reduce this disadvantage through 'personalised approaches that cater to different learning needs'.[159]

4.94 ACSSO contended that GenAI can 'level the playing field for students' through the equal provision of educational resources, stating:

> 4.13 AI platforms offer online libraries, educational materials, and digital resources to ensure that all students can access high quality educational content regardless of socioeconomic status. This especially benefits disadvantaged families who cannot afford costly textbooks or e-learning resources. Thanks to AI, these students can now access free or affordable educational content, which has the potential to significantly contribute to their academic success.[160]

4.95 TEQSA highlighted that GenAI tools can be used by schools to develop augmented reality experiences for students. TEQSA identified that the facilitation of virtual field trips and immersive technology will be particularly beneficial to low socio-economic schools who would otherwise not have access to the technology.[161]

Committee comment

4.96 The Committee recognises that the opportunities presented by GenAI and technology more broadly in the Australian education system are exciting. Some sectors have progressed well with integrating GenAI solutions, and the education sector as a whole needs to catch up to ensure that individuals and Australia can reap

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154 Australasian Academic Integrity Network (AAIN), *Submission 58*, p. 11.
155 Ms Meredith Clencie, Campus Principal, The Grange P–12 College, *Committee Hansard*, 13 March 2024, p. 13.
156 Professor Loble, UTS, *Committee Hansard*, 6 September 2023, p. 13.
157 TEQSA, *Submission* 33, p. 3.
158 Professor Loble, UTS, *Committee Hansard*, 6 September 2023, p. 13.
159 AAIN, *Submission 58*, p. 11.
160 ACSSO, *Submission 25*, p. 6.
161 TEQSA, *Submission* 33, p. 3.

the technology's potential benefits. It is imperative that we do not waste this opportunity and fall behind other countries.

4.97 Stakeholders disagreed however about whether certain impacts of GenAI in education give rise to risks or opportunities. For example, some argue that there are risks that GenAI could increase teacher workload, while others contend that it will reduce workload and improve productivity. Policy making needs to account for this uncertainly—especially given the rapid uptake of GenAI and limited data on the longer-term effects—and balance potential risks and benefits.

4.98 The Committee encourages the Australian Government to work with schools, TAFEs, and universities to encourage educators and students to employ GenAI tools in the different ways highlighted by UNESCO. For example, as a possibility engine, collaboration coach, and motivator.

4.99 Educational institutions and users need assistance in understanding how to take advantage of what GenAI can offer in a safe and regulated environment. While more evidence and safeguards are required, some prospects include using data-driven insights to assist in educational contexts, creating administrative efficiencies, and reducing educators' workload.

4.100 The Committee sees the value of personalised learning to enable students to access resources and build knowledge and skills, which are tailored to their needs and progress. Individuals can access diverse resources and knowledge, tailored to their specific needs and development. However, given the possibility that students could become over-reliant on the technology—not only for study and assessments, but for their daily lives—it is the Committee's view that GenAI must be used as a single resource and that the centrality of the human educator remains. Teachers, not technology, must continue to be the primary educator.

4.101 The Committee heard about the extensive issue of equity of access to GenAI tools. The Australian Government needs to ensure that students in schools, TAFEs, and universities have equitable opportunities to understand and use GenAI tools ethically, safely, and responsibly. This is important based on principles of fairness and an equal go, to level the playing field, and to build an inclusive future for all Australians, acknowledging it will potentially impact career prospects and quality of life. Equitable access to GenAI tools is also about helping to future-proof Australia.

4.102 Equity and access issues include having the infrastructure and hardware to enable the use of GenAI. The Committee recognises that for students and educators to use GenAI, they need access to a reliable internet connection, and to hardware like laptops or mobile phones, and that this access can be a challenge for marginalised communities.

4.103 Equity is also about how GenAI is evenly integrated into schools, TAFEs, and universities, and the training that comes with it, so that it can be used appropriately and beneficially. In this transition phase, the Committee heard that educators may look to, or rely upon, the practices of earlier adopters in educational institutions. There is a need to ensure that all staff and students have help in accessing and

navigating the technology. There cannot be a drop in standards nor a lack of support for cohorts already experiencing disadvantage.

4.104 Stakeholders recognised the role of government and other key players to actively step in to overcome barriers to access to GenAI. The Committee heard that the digital divide could be exacerbated by GenAI—for instance, certain cohorts not having access to high-quality tools or training—or lessened by the technology—for example, by having an AI study buddy to help in areas with teacher shortages for subjects like STEM and languages. A national roll out of a GenAI tool that is high-quality—not a lower baseline product—means disadvantaged schools can be on a more even playing field to better-resourced counterparts.

4.105 The Committee is encouraged by the potential opportunity that GenAI presents to benefit the educational experience and outcomes of all students, including by creating additional value students with a disability or learning difficulty; students from low socio-economic or ESL backgrounds; Aboriginal or Torres Strait Islander students; students living regionally or remotely; and mature-aged students if they are time poor. GenAI can offer specific benefits to each of these diverse cohorts, from translation, to personalised learning plans tailored to a particular learning challenge, to access to education regardless of place or time. It is the Committee's view that this these benefits to diverse cohorts should be actively supported.

Recommendation 15

4.106 The Committee recommends that the Australian Government invest in training to teach educators of marginalised student cohorts—including disability or learning difficulty, low socio-economic, ESL, and regional, rural or remote—about how GenAI can specifically aid them.

Recommendation 16

4.107 The Committee recommends that the Australian Government, in conjunction with educational providers, encourage educators and other staff to use GenAI tools for appropriate tasks to help streamline parts of teaching and administration.

4.108 For example, lesson planning, timetabling, reporting, and simple grading for yes/no or multiple-choice questions.

Recommendation 17

4.109 The Committee recommends that the Australian Government, in conjunction with educational providers and educators, use data-driven insights from GenAI tools for beneficial purposes.

4.110 This includes to provide individually tailored feedback for students, to respond to identified systemic trends, and to streamline assessment processes.

5. Impacts on teachers and education system

Upskilling teachers, students, and communities

Role of educators

5.1 Stakeholders agree that the role of educators will inevitably change with the integration of generative artificial intelligence (GenAI) in education. Educators will predominately become facilitators of learning.[1] AI is not expected to replace educators; rather, the norm would involve a hybrid-approach between human educators and GenAI as a collaborator.[2] Educators would remain imperative to students' acquisition of knowledge, skills, and experience,[3] and GenAI tools could help to build teachers' capabilities.[4] Tertiary Education Quality and Standards Agency (TEQSA) highlighted that:

> It is critical that the policy objective is to use AI to support educators to be more effective, rather than aiming for efficiency gains that could lead to fewer educators.[5]

5.2 TEQSA further commented that:

> While generative AI tools have the potential to revolutionize teaching and assessment practices, careful consideration of the purpose of education, the role of educators, and the evolving landscape of knowledge will be critical in harnessing the benefits of AI in a way that is inclusive and mitigates potential negative consequences. To effectively navigate an AI-dependent environment, ongoing professional development will be essential for teachers, school support staff, administrative personnel, and policymakers. [6]

1 University of South Australia (UoSA), *Submission 29*, p. 6; Curtin University *Submission 41*, pp. 1–2.
2 Curtin University, *Submission 41*, pp. 1–2.
3 TEQSA (TEQSA), *Submission 33*, p. 3.
4 Pymble Ladies' College (PLC), *Submission 93*, p. 9.
5 Tertiary Education Quality and Standards Authority (TEQSA), *Submission 33*, p. 3.
6 TEQSA, *Submission 33*, p. 4.

5.3 Educators will need to provide what AI cannot,[7] such as human connection, interaction, and role modelling,[8] as well as promoting 'uniquely human skills'.[9] Educators will need to continue to foster within themselves and their students key attributes, skills, and human values, and ensure they are not lost.[10] This is critical for student development, wellbeing, and learning outcomes.[11] Those key attributes include 'cultural sensitivity, resilience, relationships, curiosity, critical thinking, teamwork, innovation, ethics, civic engagement, and leadership'.[12] Other stakeholders have also highlighted creativity, healthy scepticism, problem-solving, and human agency as important attributes.[13]

5.4 It is essential that educators teach students to think critically to assess AI generated outputs, especially given risks of algorithm bias, inaccuracy, and misinformation and disinformation. The Centre for Digital Wellbeing (CDW) commented on the need to prioritise this skill as 'the integration of generative AI tools carries the risk of children, students, and teachers becoming passive consumers rather than active thinkers'.[14]

5.5 There may be a decrease in content transmission as a teaching practice, and a greater focus on skills-development. Educators may no longer be required to equip their students with certain knowledge and could instead focus on what students need to know to use higher order thinking and to operate safely as citizens and professionals.[15] As TEQSA highlighted:

> The rapid advancement of large language models is forcing educators to think carefully about what knowledge still needs to be taught when so much information can be so readily synthesised by AI.[16]

5.6 Several stakeholders agreed that GenAI will have a substantial impact on teaching practices and learning across all education sectors.[17] GenAI pedagogical practices must be informed by evidence-based research, educational principles underpinnings, and involve professional judgement.[18] GenAI pedagogical practices should also involve listening to educators about their use of GenAI in teaching, and evolving best practice, and sharing that information with the profession. The Queensland University of Technology argued for '…leadership and regulations around the use of generative AI that give educators rules and guardrails within which to innovate and develop practice'.[19]

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7 PLC, *Submission 93*, p. 8.
8 Independent Schools Australia (ISA), *Submission 22*, p. 11; Australasian Academic Integrity Network (AAIN), *Submission 58*, p. 6.
9 Edith Cowan University, *Submission 17*, p. 4.
10 AAIN, *Submission 58*, pp. 6–7; Monash University *Submission 3*, pp. 2–3.
11 Independent Education Union of Australia (IEUA), *Submission 26*, p. 3.
12 The University of Sydney*, Submission 44*, *Appendix C*, p. [19].
13 Mrs Kristen Migliorini, Founder and Chief Executive Officer, KomplyAi, *Committee Hansard*, 29 January 2024, p. 18; AAIN, *Submission 58*, p. 6.
14 Centre for Digital Wellbeing, *Submission 83*, p. 8.
15 Edith Cowan University, *Submission 17*, p. 2.
16 TEQSA, *Submission 33*, p. 4.
17 TEQSA, *Submission 33*, p. 4; Swinburne University of Technology, *Submission 39*, p. 3.
18 ISA, *Submission 22*, p. 4; Australian Education Union, *Submission 42*, pp. 2–3.
19 Queensland University of Technology (QUT), *Submission 57*, pp. 2–3.

5.7 There are differing views about whether there will be a place for traditional components of education. The Australasian Academic Integrity Network asserted that there will be 'a shift away from traditional educational learning [and] teaching',[20] while Mr Anthony England, Director of Innovative Learning Technologies at Pymble Ladies' College (PLC) said 'balancing the use of AI with traditional learning methods is critical to develop a holistic set of skills in students'.[21] Professor Leslie Loble AM, Industry Professor at the University of Technology Sydney (UTS), argued that 'the core fundamentals of good education' will remain crucial, including literacy and numeracy, as well as critical thinking, computational thinking, and ethical reasoning.[22]

Educating students in AI

5.8 There was broad agreement among stakeholders that educators would need to impart to students the skills and qualities required to use GenAI tools safely, responsibly, and ethically. This will also be necessary to help students navigate life generally as the technology becomes embedded into society. Monash University (MU) said that educators will need to determine 'how to teach *with* and teach *about* GenAI'.[23]

5.9 MU further stated that:

> By engaging strategically with AI tools, students and educators can develop their capacity for safe, responsible, and effective use of non-human tools, deepen critical thinking skills, build an understanding of the uses of big datasets, and understand the consequences of misuse.[24]

5.10 The Australian Academy of Science also emphasised the importance of artificial intelligence (AI) literacy:

> By demystifying and scaffolding the use of AI in our teaching, we will equip students with the skills and knowledge needed… Without appropriate education, Australia risks falling behind not only on technological advancements but also in identifying and dealing with their misuse. As such, collaboration between academia, industry and government is crucial to create a well-rounded environment for the development and implementation of AI in Australia.[25]

5.11 The University of Melbourne (UoM) highlighted that the Council of Europe considers that AI literacy comprises technological and human dimensions.[26] Similarly, MU said AI training should encompass:

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20 AAIN, *Submission 58*, p. 6.
21 PLC, *Submission 93*, p. 8.
22 Professor Leslie Loble AM, Industry Professor, University of Technology Sydney (UTS), *Committee Hansard*, 20 March 2024, p. 8.
23 Monash University (MU), *Submission 3*, pp. 2–3.
24 MU, *Submission 3*, p. 2.
25 Professor Philip Poronnik, Chair, National Committee for Biomedical Sciences, Australian Academy of Science, The University of Sydney, *Committee Hansard*, 2 November 2023 p. 6.
26 The University of Melbourne (UoM), *Submission 34*, p. 10.

> ● technological literacy, or understanding how machines work and how to work with them
>
> ● data literacy, which is the fluency to interpret and utilise the information on which technology operates, and which is generated by it
>
> ● human literacy, which cultivates human traits such as entrepreneurship, ethics, care, leadership, and understanding of intercultural contexts.[27]

5.12 Regarding technological and data literacies, people will need to learn about how to use GenAI tools appropriately and confidently, the technology's benefits, and risks such as biased, inaccurate, or outdated results.[28] Similarly, in the context of the Australian Curriculum, Australian Curriculum Assessment & Reporting Authority (ACARA) said:

> For students to understand what AI is and how it works, they need to be taught about the concepts of chance, data and algorithms, to explore the risks and challenges of AI, its diverse applications and how to leverage it for positive impact as either users of AI or designers of digital solutions.[29]

5.13 As described in Chapter 2, there are various initiatives to promote AI literacies for students. For example, there are pilot projects at the state level—like in South Australia, New South Wales and Queensland—and at the institutional level, for instance at MU and PLC. The Grok Academy, with Amazon Web Services (AWS), is integrating digital and AI skills into school classrooms.[30] The Grok Academy is providing K–12 students with free online and self-paced cloud learning resources that are consistent with the Australian Curriculum, and aims to roll this out throughout Australia.[31]

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27 MU, *Submission 3*, pp. 2–3.

28 UoM, *Submission 34*, pp. 9–10.

29 Australian Curriculum, Assessment and Reporting Authority (ACARA), *Submission 16*, p. 1.

30 Amazon Web Services (AWS), *Submission 85*, p. 5; Australian Academy of Technological Sciences and Engineering (AATSE), *Submission 14*, pp. 1–2.

31 Ms Kylie Walker, Chief Executive Officer, Australian Academy of Technological Sciences and Engineering, *Committee Hansard*, 5 February 2024, p.16; AWS, *Submission 85*, p. 5.

Future workforce and national interest

5.14 It is in the national interest to promote AI literacies. AWS explained that having a digitally skilled workforce is crucial to creating a prosperous Australia, and that this is best achieved through equipping school and tertiary students through curriculums.[32] Students will 'become the next generation of AI leaders'. The Australian Academy of Technological Sciences and Engineering (AATSE) expressed a similar view:

> It is vital that we not only prepare students for this, but give them… a competitive advantage by training the next generation of AI leaders who can both use and improve AI to build a stronger nation.[33]

5.15 Educators at the school and tertiary levels need to prepare students for the use of GenAI in current and future workplaces.[34] Workplaces will increasingly involve 'human-AI collaborative relationships',[35] especially as businesses and government find productivity gains.[36] Further, AI will 'profoundly alter future employment types and the skill sets needed to service them', and employers will want GenAI literate graduates.[37] Edith Cowan University said that graduates would need to tell potential employers 'what they offer, over and above the outputs of AI tools'.[38]

5.16 Swinburne University suggested making the 'use of generative AI tools… a key component of student learning and thus fostered through targeted work-integrated learning pedagogy that embeds opportunities for students to experience general as well as discipline-specific generative AI workplace applications', such as internships and industry-linked projects. Swinburne University further recommended that universities and regulatory bodies stay abreast of the industry practices involving GenAI and update their curricula accordingly.[39]

Upskilling educators

5.17 The broad ecosystem in the education space requires AI training and literacy, as the National Tertiary Education Union (NTEU) pointed out:

> This should extend to all staff who are engaged with teaching, learning and research, as well as administrative and professional/technical staff, where there is the expectation or necessity for AI to be part of their activities. In particular, casual, sessional, contract and other staff employed non-permanently should be supported by the institution in relation to their professional development around the use of AI.[40]

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32 AWS, *Submission 85*, p. 5.
33 AATSE, *Submission 14*, p. 2.
34 MU, *Submission 3*, pp. 2–3; Swinburne University of Technology, *Submission 39*, pp.1–3; AATSE, *Submission 14*, pp. 2–3.
35 MU, *Submission 3*, p.2.
36 Swinburne University of Technology, *Submission 39*, pp.1–3.
37 Swinburne University of Technology, *Submission 39*, pp.1–3.
38 Edith Cowan University, *Submission 17*, p. 2.
39 Swinburne University of Technology, *Submission 39*, pp.1–3.
40 National Tertiary Education Union (NTEU), *Submission 52*, p. 8.

5.18 Education students at university also require AI training.[41] AWS suggested having it 'within the teaching qualification and broader teacher accreditation and professional development frameworks'.[42] Integrating this into the curriculum at university is discussed in Chapter 4. Additionally, some stakeholders said it should be developed in consultation with the higher education (HE) sector, accreditation and registration bodies, and industry partners.[43]

5.19 The current education workforce also needs to be equipped with the knowledge and skills to teach with, and about, GenAI. Professional development (PD) should cover the purpose of GenAI, how to use it safely and responsibly, how to integrate it into teaching practices, the technology's risks and benefits, and implications of key policy changes.[44] This training is important to ensure that teachers themselves have solid AI literacy that they can in turn build in their students,[45] that the tools uses align with the curriculum,[46] and that the uses improve student outcomes.[47] PD and training is needed to mitigate against risks such as '… job insecurity and skills obsolescence among educators'.[48]

5.20 AI tools are already being deployed in educational settings, and educators often feel ill-prepared by their institutions. The NTEU said its "members have felt that these things have been pushed on them".[49] There is also some resistance to GenAI amongst teachers.[50] Teachers' attitudes towards GenAI vary, partly due to a lack of school support, access to experts and communities of practice, ethical issues around cheating and unfair equity of access, and a lack of evidence of the benefits on teaching and learning.[51] Effective communication is needed about GenAI, which would also help to appease anxiety and dispel myths around the technology.

5.21 There was a consensus between stakeholders that PD needs to be ongoing, so that educators can stay abreast of technological advancements and can adapt their pedagogical practices accordingly. PD also needs to be rolled out quickly and in a targeted way.[52] Additionally, it needs to be accessible and easily digestible, especially as educators are time poor and given teacher burnout.[53] Given this, if GenAI training

41 School of Education, La Trobe University, *Submission 91*, pp. 2, 6.
42 AWS, *Submission 85*, p. 6.
43 AAIN, *Submission 58*, pp. 6-7; AATSE, *Submission 14*, p. 3.
44 University of Technology Sydney (UTS), *Submission 71*, p. 5; QUT, *Submission 57*, p. 3.
45 Professor Loble, UTS, *Submission 49*, p. 3.
46 ACARA, *Submission 16*, p. 5.
47 Professor Loble, UTS, *Submission 49*, p. 3.
48 PLC, *Submission 93*, p. 9.
49 Mr Kieran McCarron, Policy Officer, National Tertiary Education Union, *Committee Hansard*, 11 October 2023, p. 12.
50 PLC, *Submission 93*, p. 9.
51 School of Education, La Trobe University, *Submission 91*, pp. 2, 6; Victorian Association for the Teaching of English, *Submission 10*, p. 6.
52 Western Sydney University, *Submission 35*, p. 2.
53 Ms Julie Birmingham, First Assistant Secretary, Teaching and Learning Division, Department of Education (DoE), *Committee Hansard*, 6 March 2024, p. 3; PLC, *Submission 93*, p. 9.

becomes compulsory, teachers should be supported by their employers to complete it during school hours.[54]

5.22 PD may include online and in-person webinars, seminars, modules, guides, and other resources.[55] The Grok Academy is working with AWS to provide primary to secondary school teachers with free PD resources.[56] ACARA is creating modules and is '… keen to partner with jurisdictions and sectors and teacher professional associations to support teachers to plan and implement the curriculum relevant to understanding AI'.[57] Stakeholders have also said that there is a lot of collaboration and information-sharing in the education sector, including from early adopters.[58]

5.23 Some other suggestions regarding upskilling educators include:

- significant investment in PD for all affected staff and support for States and Territories to roll it out
- consideration of other countries' approaches. For instance, Singapore has 'a national strategy for the inclusion of generative AI in Initial Teacher Education and also a national professional development program'.[59] Currently, there is no national rollout plan in Australia
- the National AI Schools Taskforce could consider the provision of teacher training as part of the implementation of the *Australian Framework for Generative AI in Schools*
- PD in AI as the next body of work regarding the 'National Teacher Workforce Action Plan and all of the investments in supporting teachers in their craft and trying to reduce teacher workload'
- collaborations between educational institutions, governments, industry and non-profits to assist educators
- a virtual schools hub, which may be an 'industry-government partnership that then leverages the work of universities'
- La Trobe University suggested 'funding at universities to deliver evidence-based courses (including short courses/microcredentials) …'.[60]

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54 Ms Veronica Yewdall, Assistant Federal Secretary, Independent Education Union of Australia (IEUA), *Committee Hansard*, 11 October 2023, p. 7.

55 PLC, *Submission 93*, p. 9.

56 AWS, *Submission 85*, p. 5; AATSE, *Submission 14*, p. 3.

57 ACARA, *Submission 16*, p. 5.

58 Ms Birmingham, DoE, Committee Hansard, 6 March 2024, p. 3.

59 QUT, *Submission 57*, p. 6.

60 UoSA, *Submission 29*, pp. 2-3; Western Sydney University, *Submission 35*, p. 2; QUT, *Submission 57*, p. 6; Ms Birmingham, DoE, *Committee Hansard*, 6 March 2024, p. 3; AWS, *Submission 85*, p. 5; Mrs Migliorini, KomplyAi, *Committee Hansard*, 29 January 2024, p. 20; School of Education, La Trobe University, *Submission 91*, p. 2.

AI champions

5.24 One repeated idea was to have AI champions throughout the educational system in Australia. AI champions could assist educators and consequently students, as well as corporate functions, through peer-to-peer learning and sharing.[61] This already exists in specific institutions, like PLC. Mr England stated:

> Normally best practice informs policy and what we do. But we don't have that luxury, so I need my staff—those that are willing to experiment. I want to give them familiarisation with tools, and then get them to go and use it and share their insights with their colleagues…Sixty AI champions will be established across the college over 2024, and those people will be charged with promoting its use within their subgroups…[62]

5.25 The eSafety Commission already has a network of 900 eSafety Champions within schools, many of who are deputies and wellbeing teachers. The Commission also provides preservice training for teachers and PD opportunities for teachers. The Commission's eSafety providers, accredited independent organisations, also support schools. Lastly, the eSafety Commission has risk assessments of emerging technologies, and other resources, for schools.[63]

5.26 Several stakeholders highlighted the importance of ensuring equal access to PD, so that educators and students do not get left behind, thereby widening the digital gap. Lower socio-economic schools could get additional resources to access GenAI tools, resources, and implementation support.[64] AI champions could be funded,[65] and communities of practice could be established, as well as partnerships between well-resourced and disadvantaged schools. The AI itself could also be used to identify educators' skill gaps and recommend resources.[66]

Role of parents and guardians

5.27 It is important that parents and guardians understand, and are comfortable with, the use of GenAI in schools, to help support students. Parental permissions are required and are causing delays to use the tools.[67] The Australian Council of State School Organisations (ACSSO) stressed that it is vital that there is awareness raising for

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61 Dr Aaron Lane, RMIT Blockchain Innovation Hub, *Committee Hansard*, 9 November 2023, p. 14

62 Mr Anthony England, Director, Innovative Learning Technologies, PLC, *Committee Hansard*, 29 January 2024, p. 2.

63 Mr Paul Clark, Acting Executive Manager, Education, Prevention and Inclusion Branch, Office of the eSafety Commissioner, *Committee Hansard*, 4 October 2023, p. 12.

64 UTS, *Submission 71*, p. 5.

65 Dr Lucinda McKnight, Research Fellow, Centre for Educational Impact Centre, Deakin University, *Committee Hansard*, 9 November 2023, p. 14.

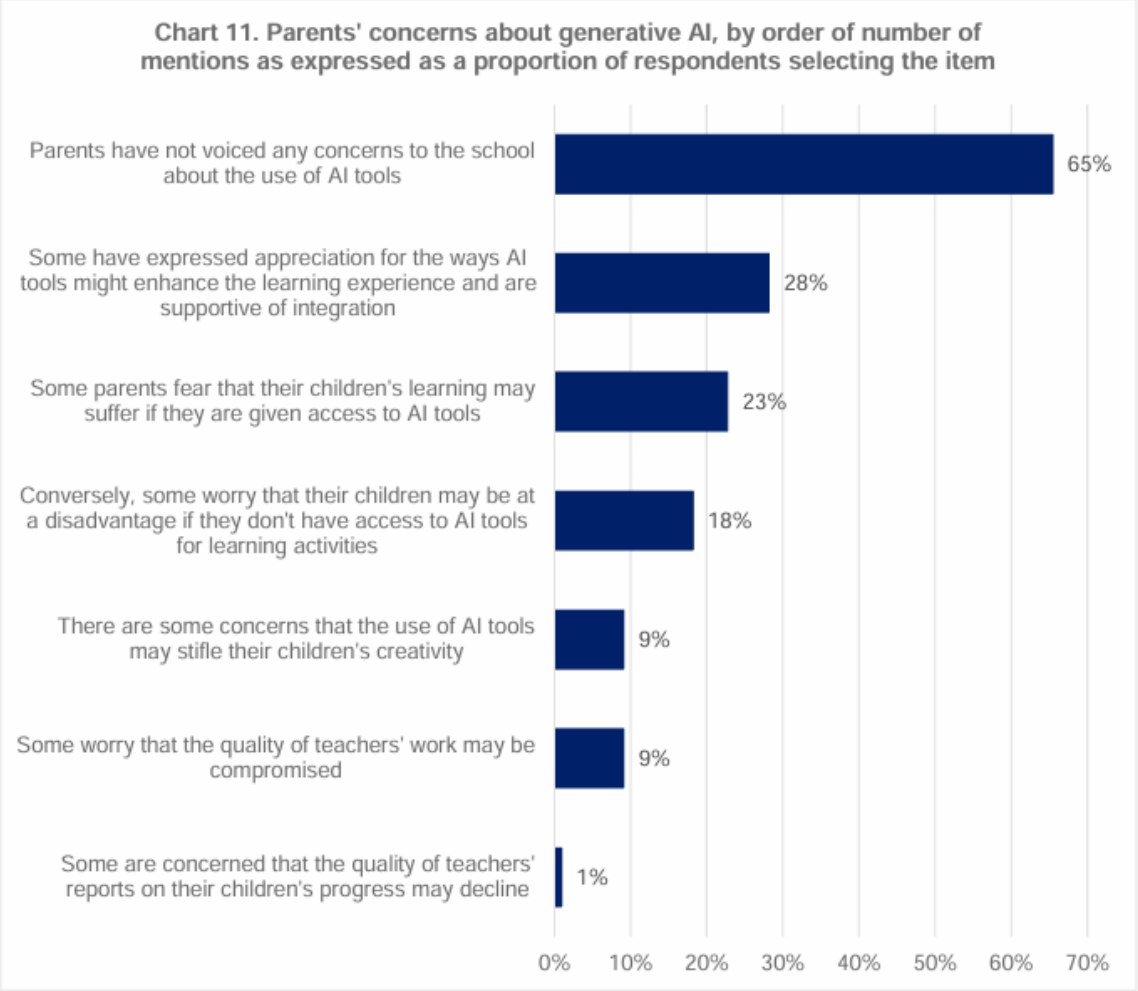
66 Dr McKnight, Deakin University, *Committee Hansard*, 9 November 2023, p. 14.

67 Association of Heads of Independent Schools of Australia (AHISA), *Submission 82*, p. 5; Australian Science and Mathematics School, *Submission 31*, p. 3.

parents and guardians about what GenAI is, how it can be used, and the possible benefits and risks.[68]

5.28 Parents and guardians have varied views about their children using GenAI in education, and AI literacy levels. Federation of Parents and Citizens Associations of New South Wales reported that their members had raised both benefits and risks with GenAI for students.[69] According to ACSSO, as well as Association of Heads of Independent Schools of Australia's (AHISA) survey report, parents were especially concerned about academic integrity, including the detection and punishment of their children for using GenAI in assessments, and also privacy breaches.[70] Figure 5.1 highlights some of AHISA's findings about parents' views of GenAI:

Figure 5.1



[68] Australian Council of State School Organisations (ACSSO), *Submission 25*, p. 22.
[69] Federation of Parents and Citizens Associations of New South Wales, *Submission 43,* pp. 2–6.
[70] ACSSO, *Submission 25*, p. 22.

Source: AHISA Member Survey: The use of generative AI in Australian independent schools, July 2023, Association of Heads of Independent Schools of Australia, *Submission 82*, p. 25.

5.29 Many stakeholders could raise awareness, such as the schools themselves,[71] parent groups, external providers or the government. The eSafety Commission already has readily available information for parents.[72] AHISA hoped the *Australian Framework for Generative AI in Schools* would help gain parents' trust.[73] It is up to schools to transparently share information about 'what they're doing and how they're intending to use it…' and to provide support.[74] There also needs to be a focus on how it can assist students who are in the 'low-equity achievement gap'.[75]

Lack of evidence of impacts

5.30 Despite the potential for GenAI to revolutionise education, there is a broad consensus that there is a need to strengthen the evidence base about the short-term and long-term impacts of GenAI on education. This includes a lack of evidence about the effects of these tools in specific and nuanced contexts. To date, there is no compelling evidence that GenAI tools would provide any advantage to learning. More broadly, according to the United Nations Educational, Scientific and Cultural Organization, it is not apparent that educational technology (EdTech) has improved learning at all, despite millions of dollars being invested worldwide.[76]

5.31 Like many stakeholders, the University of Sydney argued for research into 'the safe and effective use of generative AI to improve evidence-based teaching, learning and assessment in the Australian school, vocational and higher education sectors'.[77] Similarly, the University of South Australia said investment into research and development (R&D) is important to 'rigorously evaluate the role of AI in education', including its impacts on teaching and learning and workforce requirements.[78]

5.32 A solid and tested evidence base is also needed to inform the development of tools, policies, and practices.[79] Better evidence is also required to manage risks of using GenAI in education. For instance, schools in Australia are 'seeking guidance and evidence-based strategies to implement generative AI through a risk management

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71 Mr Chris Davern, Assistant Secretary, Strategic Policy Branch, Strategy, Data and Measurement Division, Corporate and Enabling Services Group, Department of Education (DoE), *Committee Hansard*, 6 March 2024, p. 5.

72 Mrs Lorraine Finlay, Human Rights Commissioner, Australian Human Rights Commission, *Committee Hansard*, 4 October 2023, p. 13.

73 AHISA, *Submission 82*, p. 7.

74 Mr Davern, DoE, *Committee Hansard*, 6 March 2024, p. 5.

75 ACSSO, *Submission 25*, p. 22.

76 United Nations Educational, Scientific and Cultural Organization (UNESCO), *Global Education Monitoring Report 2023: Technology in education – A tool on whose terms?*, UNESCO, 2023, p 11, viewed 5 September 2024.

77 Ms Birmingham, DoE, *Committee Hansard*, 6 March 2024, p. 3

78 UoSA, *Submission 29*, pp. 11–12.

79 Cooperative Research Australia (CRA), *Submission 88*, pp. 5–6.

framework'.[80] Without solid evidence backing the use of GenAI in educational settings, there could be serious and harmful consequences.[81]

5.33 The lack of a strong evidence base is linked to GenAI in education being an emerging field with few experts.[82] Further, the technology is rapidly changing, and it is in its early stages of adoption in the Australian education system.[83] It is unclear what works with GenAI in education and why, particularly around:

- the efficacy of the tools and whether they align with educational goals
- the tools' effects on education systems, pedagogical practice, and learning practices
- possible benefits and risks to users
- the broader impacts on the human condition.[84]

5.34 Many countries are investing into R&D on AI in education. In 2023, the United States announced seven new AI centres, with two focussed on education. Stakeholders noted similar efforts and substantial funding for collaborative research centres in the United Kingdom, China, and in some European countries (€80M to create The National AI Education Lab to research the development and uptake of AI in education).[85]

5.35 The Committee heard 'that Australia is lagging behind competitor nations when it comes to our investment in AI and indeed research more broadly', which is needed to develop GenAI products of our own.[86] Likewise, Professor Shazia Sadiq, Fellow at AATSE, stated that:

> Australia is lagging behind in terms of investment into large collaborative research centres for AI in education. The good news is that we are not lagging behind in terms of our equity into global research and knowledge systems. There are many amazing researchers in Australia… who are world leaders in this space—Monash, UniSA, UQ, University of Sydney, to name a few…[87]

80 ISA, *Submission 22*, p. 13.
81 CRA, *Submission 88*, pp. 5–6.
82 Ms Birmingham, DoE, *Committee Hansard,* 13 September 2023, p. 3.
83 Mrs Danielle Cronin, Director of Education Policy, Catholic Schools New South Wales, *Committee Hansard,* 30 January 2024, p. 25; Mr Brad Hayes, Federal Secretary, Independent Education Union of Australia (IEUA); Ms Yewdall, IEUA, *Committee Hansard*, 11 October 2023, p 8.
84 ISA, *Submission 22*, p. 4; University of Technology Sydney, Centre for Research on Education in a Digital Society (UTS CREDS) *Submission 19*, p. 4; Ms Birmingham, DoE, *Committee Hansard,* 13 September 2023, p. 3; CRA, *Submission 88*, p. 6.
85 Professor Shazia Sadiq, Fellow, AATSE, *Committee Hansard*, 5 February 2024, p. 15; Acting Professor Jason Lodge, *Submission 24*, p. 1; UoSA, *Submission 29,* pp. 11–12.
86 Ms Vicki Thompson, Chief Executive, Group of Eight Universities, *Committee Hansard*, 20 September 2023, p. 1.
87 Professor Sadiq, AATSE, *Committee Hansard*, 5 February 2024, p. 15.

5.36 Stakeholders identified possible ways to address the issue of the lack of evidence about GenAI and its impacts, including:

- regulation and guidelines to protect consumers[88]
- funding for ongoing R&D, and monitoring and evaluating[89]
- establishment of research centres[90]
- 'collaboration between educators, researchers, policymakers, and technology developers'[91]
- trials of evidence-based programs.[92]

Possible impacts on assessment

5.37 There was general agreement between stakeholders that GenAI would have considerable impacts on assessment design and practices across all levels of education.[93] This is because GenAI presents major challenges to assessment integrity, as well as some opportunities.[94] GenAI is already impacting approaches to assessment in schools and HE,[95] and some significant shifts are underway.[96]

Risks

5.38 GenAI tools are prompting a fundamental questioning of how to approach assessments, especially the written essay. This type of research-based assessment has long been plagued with issues such as contract cheating and plagiarism, which could be exacerbated by GenAI. GenAI presents issues of authorship, which also affects academic and research integrity. These concerns also apply to assessments as GenAI can be used by students to cheat and muddy the waters about who produced what content.[97]

5.39 There will need to be new ways to verify students' identity and work when completing assessments.[98] Whilst AI detection tools exist, they have limited effectiveness in identifying AI generated content.[99] This is especially so 'given the emergent nature and widespread accessibility of generative AI tools and large size of many higher education classes'. Plagiarism using GenAI poses reputational risks to students and their careers, institutions and the education sector at large. The Australian Academic

88 UTS CREDS, *Submission 19*, pp. 5–6.
89 UTS, *Submission 71*, p. 2.
90 School of Education, La Trobe University, *Submission 91*, p. 2.
91 CRA, *Submission 88*, p. 6.
92 ISA, *Submission 22*, p. 4.
93 TEQSA, *Submission 33*, p. 1; UoSA, *Submission 29*, p. 5.
94 Curtin University, *Submission 41*, pp. 1-2.
95 UoSA, *Submission 29*, p. 5.
96 School of Education, La Trobe University, *Submission 91*, p. 5; NTEU, *Submission 52*, p. 3.
97 School of Education, La Trobe University, *Submission 91*, p. 5.
98 UTS, *Submission 71*, p. 4.
99 UoM, *Submission 34*, p. 6; AAIN, *Submission 58*, p. 9.

Integrity Network argued that 'strategies and resourcing are needed to address significant risks of misuse and falsification by students claiming the outputs of generative AI as their original work'.[100]

5.40 Many universities have not been using AI detection tools as they are still in the early stages of development.[101] The UoM has been helping to test a tool launched by Turnitin in April 2023, which aims to identify AI generated content. The UoM's tests have revealed 'that these tools may be more likely to flag false positives where human authors use simple, predictable, or consistent word choices and sentence structures' and forewarned that the 'reliability of detection tools may vary as new, more sophisticated large language models are developed'.[102]

5.41 Further, many stakeholders agreed that it will be difficult for schools and HE providers to certify whether the desired learning outcomes have been met if GenAI has been used.[103] This could make it complex for accreditation bodies to know whether to award degrees to students.[104] It is a minimum requirement under TEQSA's *Higher Education Standards Framework* that educators design assessments that can accurately show whether a student has demonstrated the required skills and knowledge.[105] TEQSA warned that:

> It is crucial that the education sector develops new methods of assessment that can ensure learning outcomes in an age of AI tools to prevent an uncoupling of learning and assessment, which could have far-reaching consequences.[106]

5.42 Another issue is that HE institutions have inconsistent policies and practices when it comes to GenAI and assessments, with some banning it and others supporting it.[107] This creates an uneven playing field for students, and different expectations on educators. At the HE level, TEQSA could play a leadership role.

5.43 Schools have some guidance around assessments and GenAI. The *Australian Framework for Generative AI in Schools* includes the following:

> Learning design: work designed for students, including assessments, clearly outlines how generative AI tools should or should not be used and allows for a clear and unbiased evaluation of student ability.
>
> Academic integrity: students are supported to use generative AI tools ethically in their schoolwork, including by ensuring appropriate attribution.[108]

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100 AAIN, *Submission 58*, p. 9.
101 AAIN, *Submission 58*, p. 9.
102 UoM, *Submission 34*, p. 6.
103 UTS, *Submission 71*, p. 4; NTEU, *Submission 52*, p. 3; The University of Sydney*, Submission 44*, pp. 5–6; Curtin University, *Submission 41*, pp.1–2.
104 Curtin University, *Submission 41*, pp.1–2.
105 NTEU, *Submission 52*, p. 3.
106 TEQSA, *Submission 33*, p. 4.
107 Claire Field, Submission 70, p. 9.
108 Department of Education, *Australian Framework for Generative Artificial Intelligence (AI) in Schools*, 17 November 2023, viewed 15 August 2024.

Possible shifts

5.44 There was broad agreement among inquiry participants that traditional methods of assessments have become less effective.[109] Students can get GenAI to complete a lot of traditional assessment for them, such as producing essays.[110] The education sector needs to shift towards more 'authentic' assessment practices to support academic integrity, that focus on testing human skills, such as critical thinking, and 'knowledge integration [and] ethical practice'.[111] Assessing for knowledge of key content will remain important.[112]

5.45 A change towards more authentic assessments could, however, be more labour-intensive for educators to design and implement, such as in-person examinations (e.g. defending your thesis).[113] There will be a greater need for more one on one student-staff interaction to ensure learning outcomes have been achieved and that cheating has not occurred.[114] This is particularly difficult for educators with hundreds of students, so sustainable strategies need to be developed and the student-teacher ratio may need to be reconsidered.[115] The change toward authentic assessments could also require educators to have extra evaluation measures.[116] Educators could also have an increased workload if they are required to 'continuously develop new methods of assessment that assess students at a level beyond the levels of AIs'.[117]

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109 Australian Catholic University (ACU), *Submission 68*, p. 3; UoSA, *Submission 29*, p. 5.

110 TEQSA, *Submission 33*, p. 4.

111 Curtin University, *Submission 41*, pp.1-2; Western Sydney University, *Submission 35*, p. 2; UoSA, *Submission 29*, p. 5; ACU, *Submission 68*, p. 3; Association for Academic Language and Learning, *Submission 11*, pp 1-2.

112 TEQSA, *Submission 33*, p. 4.

113 TEQSA, *Submission 33*, p. 4; UTS, *Submission 71*, p. 4.

114 NTEU, *Submission 52*, p. 3.

115 UTS, *Submission 71*, p. 4; NTEU, *Submission 52*, p. 3.

116 TEQSA, *Submission 33*, p. 4; UTS, *Submission 71*, p. 4

117 Mr Kieran McCaron, Policy Officer, National Tertiary Education Union, *Committee Hansard,* 11 October 2023, p. 11.

5.46 The assessment transition could involve understanding and using GenAI for 'the design and conduct of assessment'.[118] Educators collaborating with GenAI to create more tailored assignments designed to 'prompt students to apply their knowledge and to foster critical and creative thinking'.[119] Students could be asked to integrate GenAI as part of the assessment.[120] The University of Sydney had developed a two-lane approach to assist educators:

> Lane 1 includes secure assessments predominantly in a live, supervised setting, designed to be as authentic as possible. Lane 2 includes setting assignments where students are encouraged and taught how to collaborate with Gen-AI productively and responsibly, focusing on assessing the *process* of learning as well as the *product* of that learning.[121]

5.47 Several stakeholders highlighted a likely shift from product-orientated assessment to focus more on the processes of learning. UTS said this could involve 'students documenting and reflecting on how they have tackled a task, aided by analytics that capture activity traces, and enable novel forms of personalised feedback'.[122] Students could be tested on critically evaluating the AI generated content used in their assessments, including modifying it, as well critiquing the learning process itself.[123] This collaborative approach with GenAI would also help to prepare students for using GenAI in the workplace.[124]

5.48 GenAI also presents opportunities for assessments. Assessment could take advantage of new ways of learning with GenAI.[125] Students may create more sophisticated responses to assessment by using GenAI.[126] Western Sydney University outlined certain benefits of using GenAI for assessments, stating:

> personalised student assessment and individualised feedback, tailored learning paths, augmented assessment (e.g. immersive and real-world simulations), increased formative assessment—feedback at scale, immediate interventions for students at risk.[127]

5.49 Schools looking to solve the risks and challenges with GenAI are implementing solutions such as smaller, more frequent assessments, on-the-spot tests and exams and oral presentations to verify student working knowledge and ensure academic integrity.[128]

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118 AAIN, *Submission 58*, pp. 6–7.
119 Monash DeepNeuron, *Submission 75*, p. 2; UoSA, *Submission 29*, p. 5; The University of Sydney, *Submission 44*, pp. 5–6; MU, *Submission 3*, pp. 2–3.
120 UoSA, *Submission 29*, p. 5; The University of Sydney, *Submission 44*, pp. 5–6.
121 The University of Sydney, *Submission 44*, pp. 5–6.
122 UTS, *Submission 71*, p. 4.
123 NTEU, *Submission 52*, p. 3; TEQSA, *Submission 33*, p. 4.
124 UoSA, *Submission 29*, p. 5.
125 UTS, *Submission 71*, p. 4.
126 ACU, *Submission 68*, p. 3.
127 Western Sydney University, *Submission 35*, p. 2.
128 Mr Hayes, IEUA, *Committee Hansard,* 11 October 2023, pp. 5–6.

5.50 Stakeholders had many recommendations about how to move forward with assessments in the emergence of GenAI, such as:

- reassess the purposes of assessment and what might be required to verify that learning outcomes have been achieved[129]
- develop assessment guidance that increases resilience to GenAI and takes advantage of the benefits of GenAI[130]
- have programmatic assessment, use EdTech, combine 'educator and peer feedback with automated feedback', and promote the quick adoption of robust assessment design principles.[131]

5.51 The University of Sydney concisely recommended:

> • Adapting to GenAI, rather than trying to ban or outrun the technology.
>
> • Rediscovering what it means to be human and assessing these skills and attributes.
>
> • Refocusing on the desired student learning outcomes.
>
> • Assessing the learning process as well as the product.
>
> • Co-creating outputs with GenAI.
>
> • Evaluating outputs co-created with GenAI.
>
> • Asking students to describe and reflect on their use of Gen-AI and the lessons learnt.[132]

Potential impacts on academic and research integrity

5.52 There are many risks associated with the use of GenAI to academic and research integrity. Ai Group raised critical issues, including accuracy of data, peer review use, authorship, intellectual property (IP), and ethical and privacy concerns.[133] This chapter discusses more views on academic integrity as it relates to assessments and plagiarism.

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129 TEQSA, *Submission 33*, p. 4.

130 UTS, *Submission 71*, p. 4; AATSE, *Submission 14*, p. 3

131 UTS, *Submission 71*, p. 4.

132 The University of Sydney*, Submission 44*, pp. 5–6.

133 Ms Megan Lilly, Executive Director, Centre for Education and Training, Australian Industry Group, *Committee Hansard,* 29 November 2023, p. 2.

Authorship

5.53 The Australian Research Council (ARC) explained the issue of authorship regarding the use of GenAI in research:

> Using generative AI tools to generate text and passing that off as original could undermine the norms around authorship. Traditional attribution of authorship assumes that the author has applied their intellect, skill and effort, and appropriately acknowledged and cited the work and ideas of others that have been drawn upon as part of that content. But when generative AI tools are used, it can become difficult to identify what is work genuinely authored by that researcher or research team, or where authors have drawn upon the work of others, without acknowledgment.[134]

5.54 Dr Aaron Lane from the RMIT Blockchain Innovation Hub stated that GenAI 'does not meet the threshold of authorship'. Dr Lane asserted that GenAI should be considered in the same vein as a Google Search or Wikipedia in the production of material or research content such as journal articles, as people do not disclose the use of databases to help locate resources. Furthermore, Dr Lane acknowledged that the process of experimentation does take time, but will yield new norms in research.[135]

5.55 Under the ARC's *Policy on the Use of generative AI tools*, it cautioned applicants against using GenAI when developing their grant applications.[136] The Copyright Agency argue that originality, specifically human authorship, is a central requirement to GenAI use in Australia. This is because the assessment of student work and academic research in Australia is underpinned by the assumption that the work produced and submitted is the original work of the student. A submission that is wholly or partially generated by GenAI is not the result of the student's effort; the student is not the author.[137]

5.56 The UoM has put authorship policies in place for students and researchers using GenAI in their work. The UoM's *Authorship Policy* requires the authors listed to have made a 'significant intellectual or scholarly contribution to a research output', and be willing to take responsibility for the contribution, thereby excluding GenAI tools being named as authors.[138]

5.57 MU has similarly banned GenAI from being listed as an author and states that 'Users of GenAI are responsible for the output they use–any errors, inaccuracies in data and plagiarised work that appears in the work will be attributed to the author'. Authors must disclose where they have used GenAI to create an output and cannot solely use GenAI to develop work.[139]

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134 Australian Research Council (ARC), *Submission 77*, p. 3.
135 Dr Lane, RMIT Blockchain Innovation Hub, *Committee Hansard*, 9 November 2023, p. 16.
136 ARC, *Submission 77*, p. 3.
137 Copyright Agency, *Submission 60*, pp. 2–4.
138 UoM, *Submission 34*, p. 7.
139 MU, *Submission 3*, p. 7.

5.58 Stakeholders identified ways to ensure academic and research integrity with GenAI use, which include:

- consistent guidance from TEQSA in the sharing of useful resources given the broad nature of the current *Higher Education Standards Framework (Threshold Standards) 2021*. Updates to the Threshold Standards should be monitored and reflected in the technological advances.[140]
- establish a fund to support research through the ARC or a Centre of Excellence to support the development, use, and impact of GenAI on education.[141]
- guidelines and processes to research and academic integrity on what constitutes appropriate and ethical use in sourcing and acknowledging information.[142]

Research and data

5.59 How research degree students, academic supervisors, or researchers, interacts with GenAI will vary with context and intent of use. One example of how researchers are using GenAI is to develop research capabilities from bibliographic surveys to robotics and literary reviews.[143] The UoM did not believe that GenAI use in research currently poses a significant risk to publication integrity, but that may change. The University explained that the generated text 'is rarely at an appropriate academic level and is often wrong or absurd'. Moreover, if research material was found to have used GenAI products, it would carry serious penalties.[144]

5.60 It is important that robust and appropriate protocols are followed to ensure the integrity of research products. Australia has a research integrity framework that is overseen by the ARC and National Health and Medical Research Council (NHMRC). The ARC and the NHMRC help to implement *the 2018 Australian Code for the Responsible Conduct of Research* which includes the principles of honesty, rigour, transparency, fairness, respect, recognition, accountability, and promotion. The principles apply to the conduct of research in Australia that researchers and institutions are expected to follow and would also cover the use of GenAI in all elements of research.[145]

5.61 Several stakeholders raised concerns about the accuracy and timeliness of research data used in research projects. TEQSA contended that GenAI has the capacity to not only generate fake data and images, but also entire studies and journal articles. It can be difficult to detect and discern images generated by GenAI, which can compromise the integrity of research.[146]

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140 UoM, *Submission 34*, p. 11; MU *Submission 3*, p. 4.
141 UoM, *Submission 34*, p. 11.
142 AAIN, *Submission 58*, p. 10.
143 Dr Richard Johnson, Deputy Chief Executive Officer, Australian Research Council (ARC), *Committee Hansard*, 4 October 2023, p. 3.
144 UoM, *Submission 34*, p. 7.
145 ARC, *Submission 77*, p. 4.
146 TEQSA, *Submission 33*, p. 5.

5.62 GenAI is also prone to 'hallucinations' which can render its data unreliable. There is no expectation that GenAI needs to be truthful, even if the public thinks that it is. In fact, an argument can be made that GenAI platforms are not research tools themselves, rather they can be considered as 'interlocutors in research conversations and design and brainstorming conversations'; or a data extraction service that can synthesis data.[147]

5.63 Students from The Grange P–12 College told the Committee that GenAI platforms may not have up-to-date information which reaffirms the need to corroborate any sources used in research projects to reach more objective conclusions.[148] Furthermore, GenAI does not necessarily cite references, it searches the internet and takes information from sources and evaluates the data within its own software and parameters to answer questions.[149]

Peer review process

5.64 Stakeholders identified risks associated with using GenAI in the peer review process. TEQSA raised concerns that 'the administrative burden of the scientific peer-review process may result in reviewers outsourcing the review to AI systems to either provide the reviewer with a summary or provide feedback'. The risk here is that GenAI platforms do not have the level of expertise that a human expert may possess.[150]

5.65 The ARC asserted that GenAI may compromise the quality and integrity of the peer review process or even breach *Australian Code for the Responsible Conduct of Research, 2018* (the Code) by 'diminishing these contributions and, potentially, producing text that contains inappropriate content or commentary that is generic and lacking in rigour'.' If the Code is breached due to GenAI, it could seriously damage the 'credibility and trust in the research endeavour, both at an individual, institutional and sector level'.[151]

5.66 Expert Panel member Associate Professor Julia Powles, Director of the University of Western Australia Tech and Policy Lab, welcomed the ban on GenAI in the peer review process, and noted:

> You cannot, for example, put in a submission that you have been reviewing and say, 'Translate this for an eight-year-old,' as much as you might like to, because there are no guarantees about where that information will end up. It is useful to have such a clear position from two of our national institutions.[152]

147 Dr McKnight, Deakin University, *Committee Hansard*, 9 November 2023, p. 19.
148 Leo, Year 11 Student and Amy, Year 12 Student, The Grange P–12 College, *Committee Hansard,* 13 March 2024, p. 4.
149 Leo, The Grange P–12 College, *Committee Hansard,* 13 March 2024, p. 4.
150 TEQSA, *Submission 33*, p. 5.
151 ARC, *Submission 77*, pp. 3–4.
152 Associate Professor Julia Powles, Director, Tech and Policy Lab, University of Western Australia, *Committee Hansard*, 6 September 2023, p. 6.

Intellectual property

5.67 IP remains a problem for research integrity, as well as data integrity. The ARC warned that content produced by GenAI may be based off the IP of others and may be factually incorrect or hallucinated.[153] Some institutions have raised concerns about the disclosure of IP and confidential information. This is because GenAI tools such as ChatGPT may retain and review prompts that are entered to help AI trainers improve their systems. The UoM has advised researchers not to share confidential informational or innovation as a GenAI prompt due to fear that the IP may no longer be owned by the university.[154]

5.68 TEQSA is working with institutions to ensure that they are proactively managing the risks posed by GenAI and IP when 'sensitive pre-published research findings, doctoral theses presented for examination or grant applications are uploaded to a third-party platform'. If improperly managed, 'AI has the potential to dilute the quality of published research, obscure genuine research in a sea of AI-generated content and ultimately undermine the public's trust in the scientific process'.[155]

5.69 The Committee was informed that information entered into commercial GenAI tools, including ChatGPT, may enter the public domain and be accessed by other users and third parties.[156] The Group of 8 (Go8) shared concerns about maintaining data confidentiality, particularly regarding the health and medical disciplines as these studies rely on personal data and confidentiality. The Go8 explained that tools in the public domain risk the release of personal data in an 'uncontrolled and unauthorised manner'.[157]

5.70 The ARC has articulated that the release of material into GenAI tools constitutes a breach of confidentiality and advised that it will remove AI generated content from its assessment process.[158] However, the introduction of Microsoft Copilot may allow users to contain some data safely in bubble, thereby facilitating increased use of the tool in research.[159]

153 ARC, *Submission 77*, p. 3.
154 The UoM, *Submission 34*, pp. 7–8.
155 TEQSA, *Submission 33*, p. 5.
156 ARC, *Submission 77*, p. 4.
157 Group of Eight, *Submission 63*, p. 4.
158 ARC, *Submission 77*, p. 4; Dr Johnson, ARC, *Committee Hansard*, 4 October 2023, p. 1.
159 Dr McKnight, Deakin University, *Committee Hansard*, 9 November 2023, p. 20.

Committee comment

5.71 The Committee was impressed by the evidence presented on the possible impacts of GenAI on educators, the education workforce more broadly, teaching practices, assessment, and academic and research integrity. The Committee recognises that change is occurring quickly, and that people need support to keep up and to maximise the technology's benefits—for their individual or institutional needs. While there will be upfront time investments and costs in learning how to use GenAI, the Committee considers it a worthwhile long-term investment to realise the benefits.

5.72 Stakeholders agree that the role of educators will inevitably change with the uptake of GenAI, but that their primacy should remain as a human interface. Teachers should still be responsible for teaching the fundamentals of education, and emerging technologies like GenAI can be embedded into pedagogical practices.

5.73 It is apparent to the Committee that AI literacy and capacity-building is vital for educators, the broader workforce including policymakers, students, and their parents and guardians to learn how to use GenAI appropriately. They need support and training to be prepared and be comfortable with the technology. This applies to schools, TAFEs, and universities.

5.74 As such, a huge uplift is required nationally, including training for pre-service teachers, and professional development for existing teachers. For TAFEs and universities, this requires them to integrate GenAI into all courses as mentioned in Chapter 2, including to equip pre-service teachers. For existing teachers, one common issue is that they tend to not have time to complete more professional development, which requires employers to ensure teachers have support to do so.

5.75 The Australian Government, in collaboration with the States and Territories, can lead the way on building AI literacy. This would ensure consistency, especially given the *Australian Framework for Generative AI in Schools* and rollout of GenAI tools in schools. Many resources already exist and need to be harnessed and made accessible in a coordinated way. The Committee recognises that the Australian Government has created a Digital Technologies Hub and sees value in using it as a single online repository for information on GenAI. A cluster model of AI champions could also be established to assist everyone, including marginalised schools, to embed GenAI.

5.76 It is expected that GenAI will also have considerable impacts on the broader education workforce, and the design and implementation of assessments. These impacts will require adjustments to education policy and practice. The Committee notes the good work by the HE sector on dealing with assessment, as well as academic and research integrity, including to detect GenAI-related plagiarism.

5.77 The Committee supports the establishment of a Centre for Digital Educational Excellence. The Centre should work collaboratively with regulatory, delivery and policy agencies in governments, as well as with the technology and education sectors.

5.78 The Centre would capture best practice and data worldwide and locally in terms of GenAI use in education settings, as well as the adaptation of both curriculum and pedagogy to reflect the impact GenAI will have on both education and the world of work.

Recommendation 18

5.79 The Committee recommends that the Australian Government work with State and Territory education departments to train educators and other staff in maximising the benefits of GenAI tools in educational settings, including:

- **training for pre-service teachers**
- **professional development for existing teachers.**

Recommendation 19

5.80 The Committee recommends that the Australian Government support teachers in schools to build students' skills through project-based learning, inquiry-based approaches, and real-world problem-solving activities that demonstrate the risks of the technology.

Recommendation 20

5.81 The Committee recommends that the Australian Government, in collaboration with the State and Territory governments, develop and implement a national training rollout plan for:

- **educators and broader education workforce through professional development and training, including virtual and in-person short courses and learning modules**
- **students, through teacher delivery and online resources**
- **parents and guardians, through information campaigns, school-led meetings, and online resources.**

Recommendation 21

5.82 The Committee recommends that the Australian Government encourage:

- **the use of the existing Digital Technologies Hub as a one-stop online repository of training and resources for educators, students, and parents and guardians to learn and teach about GenAI**
- **a community of practice of AI champions, comprising lead educators and early adopters of AI in schools, TAFEs, and universities.**

Recommendation 22

5.83 The Committee recommends that universities and TAFEs embed GenAI competencies and skills across all courses and degrees.

5.84 The Committee recommends that universities provide pre-service teachers with training in AI literacy in their degrees, including built-in industry-practice.

Recommendation 23

5.85 The Committee recommends that Tertiary Education Quality and Standards Agency work with higher education providers to develop standards and frameworks, including authorship policies, to guide universities in maintaining research and academic integrity regarding GenAI.

Recommendation 24

5.86 The Committee recommends that the Australian Government establish an innovation fund for universities to undertake research and development on the positive and negative impacts and potential application of the use of GenAI in education.

Recommendation 25

5.87 The Committee recommends that the Australian Government establish a Centre for Digital Educational Excellence, modelled on the existing Cooperative Research Centres, which would act as a thought-leader in relation to both the use and development of GenAI in school and university settings.

Ms Lisa Chesters MP
Chair
21 August 2024

A. Submissions

1 Mx Joel MacKay

2 South Australia Department for Education

3 Monash University

4 Deakin University

5 Australian Association for the Teaching of English

6 University of Southern Queensland

7 Dr Pethigamage Perera

8 Australian Secondary Principals' Association

9 Bond University

10 Victorian Association for the Teaching of English

11 Association for Academic Language and Learning

12 *Name Withheld*

13 Australian Research Council Centre of Excellence for the Digital Child

14 Australian Academy of Technological Sciences and Engineering

- 14.1 Supplementary to submission 14

15 Research for Educational Impact Strategic Research Centre, Deakin University

- 15.1 Supplementary to submission 15

16 Australian Curriculum, Assessment and Reporting Authority

- 16.1 Supplementary to submission 16

17 Edith Cowan University

18 RMIT Blockchain Innovation Hub Researchers

- 18.1 Supplementary to submission 18

19 Centre for Research on Education in a Digital Society, University of Technology Sydney

20 Education Futures Studio/Sydney Policy Lab

21 The Australian Council of TESOL Associations

22 Independent Schools Australia

23 Mr Joel Davis

24 Associate Professor Jason Lodge

25 Australian Council of State School Organisations

26 Independent Education Union of Australia

27 Studiosity

28 Charles Sturt University

29 University of South Australia

30 Universities Australia

31 Australian Science and Mathematics School

32 Tech for Social Good

33 Tertiary Education and Quality Standards Agency

- 33.1 Supplementary to submission 33

34 The University of Melbourne

35 Western Sydney University

36 Copyright Advisory Group

- 36.1 Supplementary to submission 36

37 Engineers Australia

38 Open Access Australasia

39 Swinburne University of Technology

40 Regional Universities Network

41 Curtin University

42 Australian Education Union Federal Office

- 42.1 Supplementary to submission 42

43 Federation of Parents and Citizens Associations of NSW

44 The University of Sydney

45 Australian Academy of the Humanities

46 Australian Industry Group

47 Australian Professional Teachers Association

48 Department of Education

- 48.1 Supplementary to submission 48

49 Professor Leslie Loble

- 49.1 Supplementary to submission 49

50 Griffith University

51 Australian Library and Information Association

52 National Tertiary Education Union

53 Curtin Student Guild

54 Professor Phillip Dawson

55 Australian Research Alliance for Children and Youth

56 KomplyAi

57 Queensland University of Technology

58 Australasian Academic Integrity Network

59 Organisation for Economic Co-operation and Development

60 Australasian Council on Open, Distance and eLearning

61 Australian Technology Network of Universities

62 School of Cybernetics, Australian National University

63 Group of Eight

64 English Teachers Association NSW

65 Australian Human Rights Commission

66 Norther Territory Department of Education

67 National Health and Medical Research Council

68 Australian Catholic University

69 Australian Copyright Council

70 Claire Field

71 University of Technology Sydney

72 Associate Professor Erica Southgate

73 Charles Darwin University

74 Dr William Billingsley

75 Monash DeepNeuron

76 University of New South Wales

77 Australian Research Council

- 77.1 Supplementary to submission 77

78 Australasian Performing Right Association and Australasian Mechanical Copyright Owners Society

79 Andrew Duval

80 Copyright Agency

81 National Catholic Education Commission

82 Association of Heads of Independent Schools of Australia

83 Centre for Digital Wellbeing

84 eSafety Commissioner

85 Amazon Web Services

86 Shipping Australia Limited

87 Australian College of Nursing

88 Cooperative Research Australia

89 John Seddon

90 Tech Council of Australia

91 School of Education, La Trobe University

- 91.1 Supplementary to submission 91

92 Moodle

93 Pymble Ladies' College

94 Grok Academy Limited

95 Confidential

96 Tasmanian Department for Education, Children and Young People

97 Online Education Services

98 Charles Sturt University

99 Australian Academy of Science

100 Professor Danny Liu

101 Australian Publishers Association

102 Australian Society of Authors

B. Public hearings

Wednesday, 6 September 2023

Committee Room 2S3, Parliament House, Canberra

Expert panel

- Dr James Curran, Chief Executive Officer, Grok Academy
- Professor Nicholas Davis, Industry Professor of Emerging Technology and Co-Director, Human Technology Institute, University of Technology
- Professor Leslie Loble AM, Industry Professor, University of Technology Sydney
- Associate Professor Julia Powles, Director, University of Western Australia Tech and Policy Lab, University of Western Australia

Wednesday, 13 September 2023

Committee Room 1R2, Parliament House, Canberra

Commonwealth Department of Education

- Mr Chris Davern, Acting Assistant Secretary, Strategic Policy Branch
- Ms Julie Birmingham, First Assistant Secretary, Teaching and Learning

Wednesday, 20 September 2023

Committee Room 1R5, Parliament House, Canberra

Universities: Peak Bodies Roundtable

- Vicki Thomson, Chief Executive, Group of Eight
- Catriona Jackson, Chief Executive, Universities Australia
- Luke Sheehy, Executive Director, Australian Technology Network of Universities
- Professor Rowena Harper, Deputy Vice Chancellor Education, Edith Cowan University

Australian Curriculum, Assessment and Reporting Authority

- Sharon Foster, Executive Director, Curriculum
- Kim Vernon, Senior Manager, Curriculum

Tertiary Education Quality and Standards Agency

- Dr Mary Russell, Acting Chief Executive Officer

- Dr Helen Gniel, Director, Higher Education Integrity Unit

Wednesday, 4 October 2023

Committee Room 1R5, Parliament House, Canberra

Australian Research Council

- Dr Richard Johnson, Deputy Chief Executive Officer
- Dr Chris Curren, Acting Branch Manager, Research Policy Branch

Centre for Digital Wellbeing

- Ms Carla Wilshire, Director
- Ms Ine Beerens, Senior Manager

Office of the eSafety Commissioner

- Ms Kelly Tallon, Manager, Regulatory Policy & Strategy
- Mr Paul Clark, Acting Executive Manager, Education, Prevention, Inclusion

Australian Human Rights Commission

- Mrs Lorraine Finlay, Human Rights Commissioner

Wednesday, 11 October 2023

Committee Room 1R5, Parliament House, Canberra

Tech Council of Australia

- Mr Ryan Black, Head of Policy and Research

Independent Education Union of Australia

- Mr Brad Hayes, Federal Secretary
- Ms Veronica Yewdall, Assistant Federal Secretary

National Tertiary Education Union

- Mr Kieran McCarron, Policy Officer

Thursday, 2 November 2023

Committee Room 1R5, Parliament House, Canberra

Australian Education Union

- Kevin Bates, Federal Secretary

Australian Academy of Sciences

- Professor Phil Poronnik, Chair, Academy of Science National Committee for Biomedical Sciences

- Professor Ian Reid, Fellow, Academy of Science
- Dr Hayley Teasdale, Acting Director, Science Policy, Academy of Science

Thursday, 9 November 2023

Monash University, Room 201, June Hearn Room, Level 2, Chancellery Building

27 Chancellor's Walk' Clayton, Victoria

Deakin University

- Dr Jeanette Fyffe, Director, Researcher Development and Training
- Professor Phillip Dawson, Co-Director, Centre for Research in Assessment and Digital Learning

Monash University

- Professor Allie Clemans, Acting Deputy Vice Chancellor (Education)
- Dr Ari Seligmann, Academic Lead for AI in Education within the portfolio of the Deputy Vice Chancellor Education

University of Melbourne

- Dr Leah Schwartz, Director, Academic Strategy
- Professor Gregor Kennedy, Deputy Vice-Chancellor, Academic
- Professor Raoul Mulder, Professor of Higher Education

Blockchain Innovation Hub Researchers, RMIT

- Dr Darcy Allen, Deputy Director
- Dr Aaron Lane, Senior Research Fellow

Research for Educational Impact Strategic Research Centre, Deakin University

- Professor Margaret Bearman, Co-Lead Learners in a Digital World
- Dr Lucinda Knight, Research Fellow

School of Education, La Trobe University

- Professor Miriam Tanti, Associate Dean Partnerships
- Dr Alexia Maddox, Senior Lecturer in Pedagogy and Education Futures, School of Education

Monash University

- Professor Ann Nicholson, Dean, Faculty of Information Technology, Monash University
- Mr Nicholas Chan, Education Lead, Monash DeepNeuron
- Ms Ying Sim, Committee Member, Monash DeepNeuron

- Ms Merryn Cagney, Co-manager, Law and Ethics Committee, Monash DeepNeuron

Wednesday, 15 November 2023

Committee Room 1R3, Parliament House, Canberra

Evolved Reasoning

- Dr Michael Kollo, Chief Executive Officer

Victorian Association for the Teaching of English

- Associate Professor Joanne O'Mara, President
- Ms Emma Jenkins, Education Officer
- Mr Leon Furze, Council member

Wednesday, 29 November 2023

Committee Room 1R3, Parliament House, Canberra

AI Group – Centre for Education and Training (via videoconference)

- Ms Megan Lilly, Executive Director

Amazon Web Services (in person)

- Ms Sally Webster, K-12 Schools Industry Lead, Australia and New Zealand
- Ms Min Livanidis, Head of Digital Trust, Cyber and Data Policy, Australia and New Zealand

Monday, 29 January 2024

Pymble Ladies' College, Avon Road, Pymble, New South Wales

Pymble Ladies' College

- Mr Anthony England, Director – Innovative Learning Technologies

Copyright Advisory Group

- Ms Delia Browne, Director, National Copyright Unit

Australian Copyright Council

- Ms Eileen Camilleri, Chief Executive Officer

Copyright Agency

- Ms Libby Baulch, Director Policy, Government and Member Relations

KomplyAi

- Mrs Kristen Migliorini, Founder and CEO

Tuesday, 30 January 2024

University of Technology, Room 401, Level 4, Building 11, Faculty of Engineering and IT

81 Broadway, Ultimo, New South Wales

University of Technology Sydney

- Professor Simon Buckingham Shum, Director, Connected Intelligence Centre
- Professor Glenn Wightwick, Deputy Vice-Chancellor and Vice-President (Education and Students)
- Professor Fang Chen, Executive Director, Data Science Institute

University of New South Wales

- Professor Merlin Crossley, Deputy Vice-Chancellor Academic Quality
- Professor Alex Steel, Pro Vice Chancellor Education and Student Experience
- Professor Lyria Bennett Moses, Professor

Australian Catholic University

- Professor Mary Ryan, Executive Dean, Faculty of Education & Arts
- Professor Anthony Whitty, Director of Centre for Education and Innovation
- Dr Kim Rowston, Academic

The University of Sydney

- Professor Joanne Wright, Deputy Vice-Chancellor (Education)
- Professor Adam Bridgeman, Pro Vice-Chancellor (Educational Innovation)
- Professor Danny Liu, Academic Development and Leadership, Sydney Business School

Charles Sturt University

- Professor Janelle Wheat, Pro-vice Chancellor – Division of Learning and Teaching
- Dr Immaculate Motsi-Omoijiade, Senior Research Fellow, Responsible AI lead, AI and Cyberfutures Institute
- Mr Carlo Iacono, AI Strategy Development Adviser

University of Technology Sydney, Centre for Research on Education in a Digital Society

- Dr Simon Knight, Associate Professor and Centre Director

Education Futures Studio/Sydney Policy Lab, The University of Sydney

- Professor Kalervo Gulson, Education Futures Studio
- Dr Teresa Swist, Co-lead, Education Futures Studio

- Dr Kate Harrison Brennan, Director, Sydney Policy Lab
- Dr José-Miguel Bello y Villarino, Senior Research Fellow, Australian Research Council Centre of Excellence for Automatic Decision Making and Society

Australian Council of State School Organisations

- Dianne Giblin, Chief Executive Officer
- Peter Garrigan, Project Officer.

National Catholic Education Commission

- Anna Howarth, Director of Strategy, National Catholic Education Commission
- Danielle Cronin, Director of Education Policy, Catholic Schools NSW

Tech for Social Good

- Vincent Zhang, Chief Executive Officer
- Abby Shen, Chief Operating Officer

University of Technology Sydney

Monday, 5 February 2024

Committee Room 1R3, Parliament House, Canberra

South Australia Department of Education

- Professor Martin Westwell, Chief Executive
- Julia Oakley, Executive Director, System Performance
- Mr Daniel Hughes, Chief Information Officer

Northern Territory Department of Education

- Mr Saeed Amin, Deputy Chief Executive, Regional Services
- Ms Rachel Fox, Acting Director, Digital Strategy and Relationships
- Ms Kerry Hudson, Executive Director, Teaching and Learning Services

Griffith University

- Professor Elizabeth Burd, Provost

Queensland University of Technology

- Associate Professor Kate Thompson, Associate Professor of Digital Pedagogies, School of Teacher Education and Leadership

Australian Academy of Technological Sciences & Engineering (ATSE)

- Ms Kylie Walker, Chief Executive Officer
- Professor Shazia Sadiq, ATSE Fellow

School of Cybernetics, the Australian National University

- Associate Professor Andrew Meares, Deputy Director
- Dr Matthew Holt, Associate Director (Education)
- Mrs Maia Gould, Cybernetic Engagement Lead
- Dr Hannah Feldman, Research Fellow

Australasian Academic Integrity Network

- Professor Bernie Marshall, National Coordinator
- Dr Lynn Gribble, Associate Professor
- Dr Christine Slade, Member
- Dr David Morgan, Compliance, Quality and Risk Manager

Wednesday, 6 March 2024

Committee Room 1R3, Parliament House, Canberra

Commonwealth Department of Education

- Ms Julie Birmingham, First Assistant Secretary, Teaching and Learning Division
- Mr Chris Davern, Assistant Secretary, Strategic Policy Branch

Commonwealth Department of Industry, Science and Resources

- Mr Lucas Rutherford, Assistant Secretary, Department of Industry, Science and Resources

Wednesday, 13 March 2024

The Grange P–12 College, Deloraine Drive, Hoppers Crossing, Victoria

The Grange P–12 College Students

- Amy, Year 12 student
- Deshnysri, Year 10 student
- Ean, Year 10 student
- Janisha, Year 11 student
- Leo, Year 11 student
- Liam, Year 8 student
- Maeve, Year 12 student
- Rubeina, Year 12 student
- Samidha, Year 12 student
- Zainab, Year 10 student

The Grange P–12 College Staff

- Meredith Clencie, Principal, Primary
- Teagan Snowling, STEM Learning Specialist, Primary
- Tracey Hart, Digital Tech Learning Specialist, Secondary
- Dylan Phraphone, Maths/Robotics Teacher, Secondary
- Anna Skeljo, Maths Leading Teacher, Secondary
- Roshni Varma, Teacher, Secondary
- Ajay Eapen, Science Teacher, Secondary

The Grange P–12 College Council

- David Smillie, College Principal
- Jim Williamson, College Council Community representative and Director of Community Development Solutions

Wyndham Tech School

- Gail Bray, Executive Director, Digital Transformations and Quality Learning
- Sam Nikolsky, Director

Wednesday, 20 March 2024

Committee Room 2S3, Parliament House, Canberra

Expert panel

- Dr James Curran, Chief Executive Officer, Grok Academy
- Professor Nicholas Davis, Industry Professor of Emerging Technology and Co-Director, Human Technology Institute, University of Technology
- Professor Leslie Loble AM, Industry Professor, University of Technology Sydney
- Associate Professor Julia Powles, Director, University of Western Australia Tech and Policy Lab, University of Western Australia