GENERATIVE AI IN EDUCATION

12 July 2023

INTRODUCTION

The rise of generative AI (GenAI), including ChatGPT and similar tools that can create data, such as text, images and videos, represents a disruptive technological development that will change the way higher education is delivered and undertaken. This creates substantial opportunities for rethinking teaching, learning and assessment, as well as significant challenges to the traditional modes of student assessment and maintaining academic integrity. In time, it is likely that few parts of higher education will be unaffected by the power of GenAI.

In early 2023, in response to the increased availability of GenAI tools, Monash University adopted a 'responsible use' approach to education, research and operational activities. A range of actions were taken to prepare for GenAI in teaching, including additions to student and staff support materials and amendments to policies for assessment and academic misconduct. Prior to the beginning of semester 1, we reviewed key policies to identify prospective changes to support responsible use of GenAI.

To further prepare the Monash community, a University Task Force on GenAI was formed in February 2023 with similar terms of reference to this parliamentary inquiry. The work and first report of the Monash Task Force's Education subgroup, chaired by Professor Allie Clemans (Interim DVC Education), forms the basis of this response, which is focused on higher education.

We welcome further engagement on this rapidly evolving technology and associated education issues.

1. THE STRENGTHS AND BENEFITS OF GENERATIVE AI TOOLS FOR CHILDREN, STDUENTS, EDUCATORS AND SYSTEMS AND THE WAYS IN WHICH THEY CAN BE USED TO IMPROVE EDUCATION OUTCOMES

The future of work and of education will rely on human and non-human collaboration where GenAI will be used to generate content, inform decision making, analyse and present data, and enhance communication.

GenAI needs to be incorporated in higher education in order to prepare university students to be ethical human collaborators with the technology, both in academic practice and current and future professions. These tools offer potential time savings in routine tasks and the analysis of big data, as well as providing another source to input into learning and teaching both educators and learners to access and guide self-directed learning with GenAI as a provider of personalised learning and feedback.

As a starting point to positioning GenAI as a collaborator in learning at Monash, we have modified UNESCO's Quick Start Guide to Chat GPT and AI in Higher Education[1]:

Function	Description	Example
Content generator	GenAI makes content for student to use directly in their work	GenAI creates Introduction section to a written assignment
Possibility engine	GenAI generates alternative ways of expressing an idea	GenAI creates alternative responses to part of an assessed task and student uses these indirectly as inspiration

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[1]https://www.iesalc.unesco.org/wp-content/uploads/2023/04/ChatGPT-and-Artificial-Intelligence-in-higher-education-Quick-Start-guide_EN_FINAL.pdf

Function	Description	Example
Co-designer	GenAI assists with a design process	GenAI suggests ideas about designing or creating something for an assignment (e.g. with a focus on specific goals or learning outcomes)
Socratic opponent	GenAI acts as a debating partner to develop an argument	Conversational prompts are entered into GenAI to test out different angles of an issue
Research assistant	GenAI helps users to find and synthesise information on a topic	GenAI is used to find, filter, summarise, synthesise and/or critique information to be used in completing tasks or assignments
Personal tutor	GenAI is used to generate feedback on ideas and work in progress	GenAI provides personalised feedback on samples of work
Prompt engineering lab	Repeated, modified attempts to get a more precise or elaborate response	User tries different prompts in GenAI until they get a useful output

Specific Monash-wide workshops on teaching and learning have explored how to combine GenAI with human activity for most benefit. For example:

- designing and setting tasks for students, with students then critically reviewing the AI output
- using GenAI tools in ideation processes to generate starting points or linkages between seemingly disparate concepts, which are then developed by the students
- generating feedback comments, which are then moderated.

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.

2.   THE FUTURE IMPACT GENERATIVE AI TOOLS WILL HAVE ON TEACHING AND ASSESSMENT PRACTICES IN ALL EDUCATION SECTORS, THE ROLE OF EDUCATORS AND THE EDUCATION WORKFORCE GENERALLY

GenAI is likely to become embedded in teaching practices due to the efficiencies and creative possibilities of content and task generation. This means that knowing when AI technologies can enhance learning, and how to use them appropriately, is rapidly becoming necessary for academic practice and career success.

The role of educators is expanding to help students at all levels to develop the skills, awareness and capacity to interact responsibly, sustainably and effectively with GenAI in support of shared human values. Higher education plays a role in developing critical thinking, critical evaluation of sources, confidence in evaluating and using GenAI technologies, and an understanding of human-AI collaborative relationships. This is important not only for students' education but to position them, as part of current and future workforces, to actively shape relationships between GenAI use in employment so that they reflect positive values and social norms. Initially, responding to this type of skill development in higher education requires the review of curricula, infrastructure, support mechanisms, ways of communicating and collaborating with students and ongoing professional development of all staff.

Teaching practices can be enhanced through the development of standard prompts for interacting with the tools and there will be a need for greater study of prompt languages and intentional development of a range of AI literacies including:

- 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.[2]

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[2] https://www.weforum.org/agenda/2023/05/3-ways-higher-education-can-prepare-for-generative-ai-revolution

Greater attention will need to be given to the nature of assessment practices, with a different emphasis given to the process of learning rather than just to the product of learning, as well as to optimising the capacity for learning and assessment tasks to be tailored to individual learners. Educators will need to make conscious decisions about how to teach *with* and teach *about* GenAI and about what constitutes responsible use of GenAI in their assessment repertoire.

Developing educators' skills to engage in this way requires intentional professional development across the education sector as well as within institutions and across the diverse ongoing and casual workforces in higher education. For this reason, Monash has developed a range of online guides, recorded webinars and conversations with international experts, and is continuing to add new resources (refer to Appendix for detail). To further aid in the building and maintaining capabilities of educators, a 12-month residency in Monash's Education Academy has been proposed to build understanding of teaching and learning in AI.

Administrative processes and curriculum and governance structures will also be able to take advantage of the efficiencies offered by GenAI, with changes to processes at different levels of the institution likely, as well as offering possibilities for widening analysis of sector-wide trends and emerging issues.

3. THE RISKS AND CHALLENGES PRESENTED BY GENERATIVE AI TOOLS, INCLUDING IN ENSURING THEIR SAFE AND ETHICAL USE AND IN PROMOTING ONGOING ACADEMIC AND RESEARCH INTEGRITY

The risks and challenges presented by GenAI tools relate to overuse, underuse and misuse, whether intentional or inadvertent.

There is a risk that GenAI will be used inappropriately or with insufficient thought and to take short cuts in the performance of learning or assessment tasks. This is a risk both to academic integrity (and the relevant institutional policies) and to students' demonstration of evidence to ensure that unit and course learning outcomes are met.

A related risk is that erroneous or problematic outputs are left unchecked, encompassing automation bias where the user does not check or validate the GenAI output, or where technology is trusted over humans or is left to function unsupervised. For example, GenAI tools, trained on Western, Anglo-centric datasets, or that undervalue innovative or diverse thinking from students, and forms of expression that align with neurodiverse or non-native English-speaking students.

Another risk relates to underuse or an avoidance of GenAI by educators in teaching and assessment, or by students in learning practices. While there may be good reasons for avoidance, the risk is that learners do not develop an awareness of important issues relating to GenAI, or do not develop skills and literacies that will likely be required in industry and/or further study, and may also make them less likely understand how to use GenAI safely on those occasions in which they do use it. It will be necessary for the higher education sector to adequately address the impact of GenAI on its modes of study to ensure the integrity of higher education awards can be maintained, and in turn support the ongoing reputation of Australian education.

Adjacent to these is the indirect risk of failure to engage with the ethical issues raised by GenAI technologies, including:

- legal and moral questions of content and intellectual property ownership
- the potential for an erosion of trust between students, educators and institutions owing to the current inability to satisfactorily demonstrate the presence or absence of AI-generated content
- vulnerabilities of data privacy
- the reinforcement and propagation of normative data bias and both subtle and unsubtle forms of discrimination
- environmental cost (e.g. the computational power involves significant energy and water consumption).

Many aspects of AI use can be seen concurrently as benefits and as challenges or harms. For example, AI can allow students and others to quickly accomplish tasks that would previously have taken significant time and energy. This can free up capacity to do other educationally beneficial activities. However, it may also circumvent engagement with important developmental learning. We suggest that some balance is appropriate here. There may be value in students learning how to write a summary brief of a meeting in a first year subject, after which it may be acceptable for them to review the output of a GenAI meeting summary tool and focus at that point, instead, on higher-order analytic tasks, in the same way that scientific calculators replaced the need for writing out formulae, but knowledge of them is important.

Responsible modelling by university educators, leaders and other staff is an important aspect of shaping responsible use of GenAI. Clear policy, governance and expectations should help students understand when AI should or should not be used to inform decisions, and where human responsibility lies when engaging with GenAI. For example, a policy around whether and how AI can be involved in decisions about student progression or academic promotion signals the institution's understanding of the role of AI in decision-making.

![Monash University logo]

Research and research training

The fluid nature of GenAI technologies and their adaptive learning model presents a potentially significant challenge to academic and research integrity and highlights the research-teaching nexus as central to the integrity of the education system more broadly. As a tool, GenAI's breadth of use and dynamic application require an equally adaptive and responsive framework to ensure that use is transparent, constructive and responsible. The manner in which a research degree student, academic supervisor or researcher engages with GenAI will vary with context and intent of use. To this end, ensuring that appropriate protocols are followed in responsibly using and acknowledging the use of GenAI is critical to ensuring the ongoing integrity of the research product.

The Monash Research Integrity Office has released guidance to support research academics, particularly Higher Degree by Research supervisors, about the use of GenAI in research to ensure a consistent approach (Refer to Appendix).

Frameworks such as the Australian Code for the Responsible Conduct of Research need to account for the potential applications of GenAI and be responsive in providing guidance on appropriate application of AI tools to support a consistent approach across the researcher community and to ensure the integrity of Australian research business more broadly. Likewise, TEQSA Guidance notes on the risks and challenges of GenAI tools can facilitate a shared understanding and consistent application in tertiary education.

4. HOW COHORTS OF CHILDREN, STDUENTS AND FAMILITES EXPERIENCING DISADVANTAGE CAN ACCESS THE BENEFITS OF AI

As GenAI technologies become increasingly commercialised, there is a risk of inequity as some students are unable to pay for access to the same tools (or levels of functionality) as their peers. Institutional (or government) support for access to these technologies will be vital to promoting equity of opportunity. Moreover, as GenAI becomes incorporated into teaching and assessment, it is important that students have access to it, when needed, to complete their course.

Ensuring fair access to technology is not a new challenge in education, however it is a complicated proposition. Due diligence is required before licences are purchased or technological platforms are procured to ensure ethical oversight of the supply chain. Further, providing access to all students brings with it the responsibility to develop capacity for using the technology. Institutions will also need to monitor and intervene to ensure students have sufficient hardware or infrastructure to take up that access.

Inclusion and belonging is a strong focus of Monash University's current strategic plan, which invites consideration and action in relation to overturning disadvantage related to GenAI. Monash has an equity and diversity strategy to support the development of institutional policies and practices which attends to the need for inclusive strategies to address disadvantages which will extend to access of GenAI capabilities.

5. INTERNATIONAL AND DOMESTIC PRACTICES AND POLICIES IN RESPONSE TO THE INCREASED USE OF GENERATIVE AI TOOLS IN EDUCATION, INCLUDING EXAMPLES OF BEST PRACTICE IMPLEMENTATION, INDEPENDENT EVALUATION OF OUTCOMES, AND LESSONS APPLICABLE TO THE AUSTRALIAN CONTEXT

International best practice, adopted by Monash, values AI tools as facilitators of and collaborators in teaching, learning and assessment when integrated and applied responsibly. Policies were adjusted to facilitate a responsible use approach and further policy change will occur to accommodate human and non-human collaboration.

Amendments have been made to Monash's Assessment and Academic Integrity Policy, to require that:

- Academic staff educate students about the University's academic integrity standards and conditions that apply to each assessment
- Chief examiners be responsible for recording in the learning platform whether GenAI can be used for a particular unit or assessment, within the following parameters
  - All forms of GenAI use are acceptable
  - GenAI use is selectively restricted by function (e.g. students are allowed to use it for planning purposes but not for generating final content)
  - Student learning is assessed independently from GenAI technologies (e.g. via a viva)
- Where GenAI is authorised, its use must be acknowledged
- Suspected unauthorised uses of GenAI are managed as a separate allegation of misconduct in accordance with existing disciplinary procedures.

A framework is being developed to formalise GenAI within teaching and learning and to build AI literacy, with the following elements:

- Actively transition to GenAI in teaching and learning as a form of academic collaboration
- Develop staff AI capability to assess with GenAI, teach with GenAI, teach students about GenAI, and be supported by insights into teaching and learning that are generated through GenAI
- Support student AI literacy and capability to learn and perform assessments with GenAI, learn about GenAI in general and in relation to disciplinary and professional contexts
- Clearly describe the values and practices that support responsible use
- "Decriminalise" GenAI and move away from banning it or detecting its use in assessments.
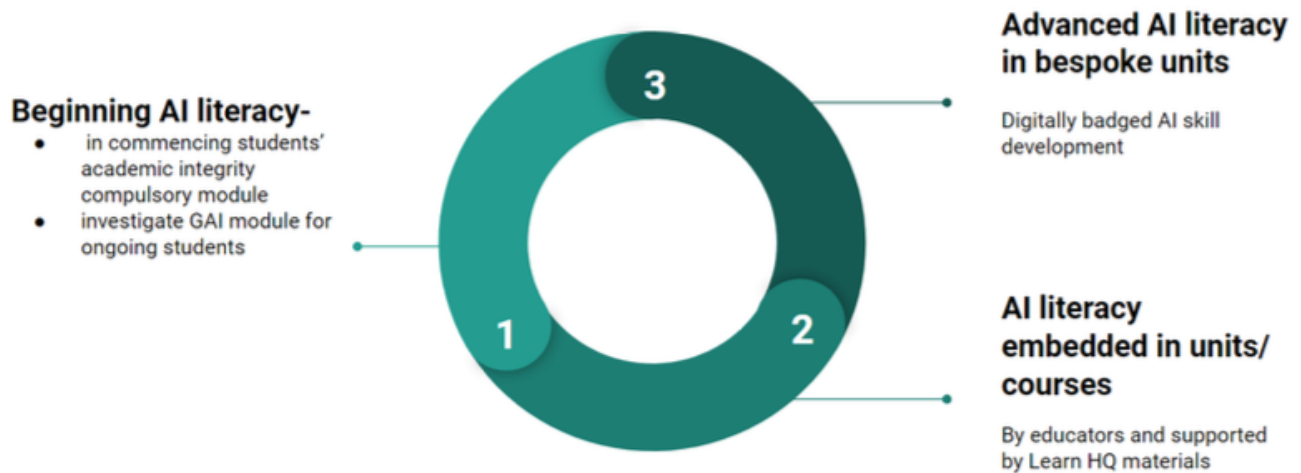
Figure 1 Monash T&L framework for GenAI integration

Practice alignment across the institution varies according to staff and student understanding and confidence with GenAI. However, there are growing instances Monash academic staff developing and testing custom GenAI applications to improve the student experience through:

- GenAI derived personalised course advisers to help students navigate degree and class requirements
- Coaching tools to develop critical human centric-skills such as teamwork
- AI-powered mock job interviews for real positions
- Simulated professional environments in which to apply skills developed in the classroom (e.g. negotiating business deals, managing social media campaigns, and developing rapport with medical patients).

This last application offers real potential for scaled and tailored work integrated learning. Specific Monash applications include

- a platform for students to practise orchestrating media campaigns using a large network of AI agents. These agents have complex personas and relationships, which react to student posts based on models built from relevant literature. The responses take into account the quality of the post and the persona of the agent. Students have to combat misinformation spread by some agents. The Large Language Model (LLM) then interprets the student's posts and model's reactions. This tool is part of a larger simulation, backed by assessments including a campaign pitch and weekly briefings and provides students an authentic opportunity to practise career-specific skills.
- a platform for one-on-one interaction with a simulated customer or client in an applied professional role, with instant feedback on the quality of the interaction. For example, in health education, the tool provides realistic 'patients' with detailed medical histories, personas, and varied willingness to share embarrassing medical details with learners who must put the work in to develop rapport with the patients to obtain relevant information in a realistic virtual clinical environment. The determination of who will share what and under what circumstances and what makes an interaction likely to develop rapport is modelled by the team - with the LLM performing the final transformation of the learner's communications into the model and the model's reply at the other end.

![Monash University logo]

6.   RECOMMENDATIONS TO MANAGE THE RISKS, SEIZE THE OPPORTUNITIES, AND GUIDE THE POTENTIAL DEVELOPMENT OF GENERATIVE AI TOOLS INCLUDIGN IN THE AREA OF STANDARDS

Based on our experience this year with GenAI, we make the following recommendations and observations:

- While there will undoubtedly be generally accepted standards and practices across the education sector nationally and globally, many of the opportunities and risks of GenAI in education fall within existing policies and procedures of individual institutions.

- The principle of institutional autonomy should be consistent with other risks in education. GenAI is new but we recommend the government response is consistent with other issues in education such as academic integrity, cyber security, etc, by setting a threshold and allowing institutions to respond in a way that best supports their own operations and communities. This does not preclude facilitated cross-sector engagement and the hosting of sector-wide working groups to discuss and prepare best practice guidelines, both for responsible use and for incorporating GenAI into existing policies and practices.

- It is recommended that a responsible use approach to the incorporation of GenAI is encouraged. Beyond a desire to encourage responsible experimentation and the development of an informed and critical awareness of the benefits and risks of GenAI, an important factor in taking this position is that detection of AI-generated content is unlikely to be feasible. Emerging evidence suggests that humans are not reliable in detecting AI-generated content. Equally, AI detection tools are non-transparent and unreliable in their testing and reporting of their own accuracy, and are likely to generate an intolerably high proportion of both false positives and false negatives.

  The exception to detection difficulties is where watermarks are injected. Watermarks are coded patterns of output that are intentionally detectable to AI detection systems. To make this system feasible would require the regulation of all GenAI technologies to mandate the injection of watermarks into their content. Unregulated GenAI technologies would allow students to avoid this. Other GenAI technologies can be used to parse watermarked content to remove the watermark. Humans can inject watermarks into human-generated content to discredit detection technologies.

- Clarity around the responsible use of GenAI in assessment is necessary to help students navigate uncertainty and to make them responsible for their own academic conduct.

- Alternative approaches to assessment will be needed, in which a combination of assessment of process, closer working relationships with students, and more complex assessments will need to be developed. As a related issue, care should be taken when adapting GenAI into marking or feedback practices. Use of GenAI in assessing student work and/or providing feedback without specialist training entails a reduction in established human expertise and, potentially, a reduction in human connection and trust relations. Thus, institutions need a clear framework for making decisions about how to incorporate GenAI into these powerful practices.

- We see GenAI as an opportunity for greater engagement with students in the design of learning. To facilitate AI literacies, Monash will use a Students as Partners approach, in which student representatives work directly with academics to collaboratively co-design learning and teaching approaches and assessments. There may be scope to develop generic course-level outcomes which align with Monash Graduate Attributes, in recognition of the importance to invest in teaching students about AI literacy.

- In relation to academic misconduct, recognising GenAI as a collaboration tool intentionally separates it from plagiarism, collusion and contract cheating. At the same time, we need to maintain mechanisms to restrict GenAI use in assessments that require students to demonstrate human capacities. Therefore, we are exploring a 'restorative practice' approach to suspected academic integrity breaches.

- Institutional governance and policy positions need to consider the context of use, responsibility for errors and consider alternative definitions, or categorisation of attributes, such as 'author' 'collaborator' which have an inherent meaning and subject position that may not be appropriate to apply to GenAI content.

In light of the above, we are confident that managing the risks and seizing the opportunities can be accomplished within the Higher Education Standards Framework (Threshold Standards) 2021 and our own institutional policies.

APPENDIX

Monash initial response, January to June 2023

At the beginning of 2023, a range of actions were taken to prepare for GenAI in teaching, including additions to student and staff support materials and amendments to policies for assessment and academic misconduct. Prior to the beginning of semester 1, we reviewed key policies to identify prospective changes to support responsible use of GenAI. These included at least 12 policies and procedures for student engagement, learning and teaching quality, course design, unit delivery, assessment, integrity, marking and feedback, and grading schema. Some changes were able to be implemented before the start of semester one, with the full implementation set for 2024 in order to prepare staff and students for the changes.

Support resources were developed for Monash's LearnHQ to develop student understanding of what GenAI is, with guides for responsible use in academic study.

Similarly, resources were developed for staff on TeachHQ, with guidance on how staff should discuss AI with students and how it may be used for assessments. This was augmented with a Town Hall discussion and webinars, including video chats with AI scholars on topics such as GenAI tools, academic integrity, large language models, and advanced applications of GenAI in teaching and learning activities. These resources are continuing to be updated.

For first semester 2023, Chief Examiners were required to set one of four options for GenAI use for a given weighted assessment activity:

1. GenAI cannot be used at all
2. Use of GenAI is authorised for a restricted and specified set of tools or types of tools, which must be appropriately acknowledged
3. Use of GenAI is authorised for restricted and specified functions and must be appropriately acknowledged
4. There are no restrictions on the use of GenAI, with appropriate acknowledgement.

Chief Examiners were advised to determine the option and note consistently within the explanatory material for each assessment task in Moodle. Specific wording was provided. Analysis showed that Option 1 (no GenAI) was selected in the majority of assessments for Monash University in the first semester, and for all of Monash College assessments.

Students provided feedback about contradictory messaging, with the banning of GenAI in assessments clashing with more progressive statements and materials on the opportunities of responsible use of AI. Therefore, a plan is being developed for the next phase of GenAI practice in teaching and learning based upon the premise of GenAI as a form of collaboration. Ongoing collaboration between Student Experience and Learning and Teaching divisions of the Education portfolio will ensure that the positioning of GenAI at Monash is aligned with key messages and ethics, potentially augmented a specified GenAI module additional to our compulsory academic integrity unit, and ensure all students have equitable and reliable access to GenAI to be able to undertake academic practices.

GenAI and research guides

Monash has put out a guide on GenAI and Research with the following directions:

- GenAI cannot be listed as an author
- Users of GenAI are responsible for the output they use - any errors, inaccuracies in data and /or plagiarised work that appears in the work will be attributed to the author.
- Work that has been created solely using GenAI will be considered plagiarism
- Where AI has been used to create an output, the author must be transparent about its use and acknowledge appropriately, including compliance with any requirements of the distribution outlet

Monash has developed a guide for students on acknowledging the use of GenAI, noting that it differs from other academic sources as there is no specific author and it is not currently able to be reproduced. It recommends a combination of a written acknowledgement of the use of GenAI and its extent, description(s) of how the information was generated, including the prompts used, and citing and referencing in style approximating the style being used for non-recoverable resources, for example:

> I acknowledge the use of ChatGPT (https://chat.openai.com/) to generate materials for background research and self-study in the drafting of this assessment. I entered the following prompts on 4 January 2023: Write a 50 word summary about the formation of Monash University. Write it in an academic style. Add references and quotations from Sir John Monash. The output from the generative artificial intelligence was adapted and modified for the final response.
> *Reference:* "Was Sir John Monash a good man?" prompt. ChatGPT, 9 Jan. version, OpenAI, 24 Jan. 2023, chat.openai.com/chat[3]

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[3] https://www.monash.edu/learnhq/build-digital-capabilities/create-online/acknowledging-the-use-of-generative-artificial-intelligence#tabs__3176853-02