

University of Warwick
Warwick International Higher Education Academy (WIHEA)

Transforming Higher Education

How we can harness AI in teaching
and assessments and uphold
academic rigour and integrity

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Executive Summary

This report captures the findings of a task and finish group with over 50 members that reviewed opportunities and risks of artificial intelligence and shared best practices over the past six months. The group was open to the entire Warwick community and was composed of students and staff, as well as members from other institutions and industry. The report does NOT represent the official Warwick position and was written to inform future decision-making. The main aim of this report is to provide guidance to staff when preparing for the new academic year.

This report is aligned to the [Russell group generative AI principles](#). It supports students and staff to become AI-literate. After reading (parts of) the report or visiting signposted webpages, staff should feel better equipped to support students to use generative AI tools effectively and appropriately. Throughout the report we make recommendations on how to adapt teaching and assessment to incorporate the ethical use of generative AI to ensure academic rigour and integrity are upheld and to support fairness and equal access. We are cognisant that the report represents a 'snapshot in time' and that AI and digital applications more broadly will continue to evolve.

The report is structured in three parts:

- ▶ The first part is written by **students**.
- ▶ This is followed by the **task and finish group** findings captured by the theme leads.
- ▶ In the third and final part we have included relevant **additional contributions** per theme that were produced outside the regular meetings.

Each of the parts is structured across six themes:

- (1) Fundamental questions around **AI in education**,
- (2) Implications for **teaching**, including helpful links for educators,
- (3) Issues of **academic integrity** and ethical concerns, both when students are encouraged to embrace AI, and when they are not supposed to use AI,
- (4) Principles of **assessments** when embracing AI,
- (5) Using AI, including generative AI, for formative **dialogue and feedback**,
- (6) Thoughts on potential future conceptualisation, development and integration of AI tools.

Due to the comprehensive nature of this report, we recommend that readers might want to choose the aspects of the report that they are interested in from the [Table of Contents](#) on [page 4](#).

For example, if interested in the student view, then start with [Chapter 1.1](#); if interested in a summary of links of useful tools for educators, go to [Chapter 3.2](#); if wanting to learn how to use generative AI to prepare tables that might be helpful for neurodivergent students' learning, go to [Chapter 3.5.2](#); and if interested in the proposed policies for AI and academic integrity, start with [Chapter 2.3](#) and continue with [Appendix 3](#).

Finally, for comments or suggestions on this report or on future initiatives, please use this link: <https://forms.gle/nuWteCwhcWMguKjAA>

Preface

Innovation is the [first of four strategic priorities](#) at the University of Warwick, with leading research in the field of [AI and digital innovation](#). Collaborating across departments, other universities and a range of other stakeholders, including the secondary school sector and employers, allowed for many enriching discussions on the topic of educational innovation triggered by generative AI. Recognising that there is no universal approach to embracing AI in education and acknowledging the need for caution, the best approach will vary depending on the specific context.

Nearly 100 years ago Sidney Pressey, when talking about his '[teaching machine](#)', foresaw that educational pedagogy combined with educational technology will be able to [modernise education](#). Some might argue that AI represents a new transformative force that allows to further modernise education, to lay the foundation for a [cognitive revolution](#), and to accelerate our current initiatives on fairness, equity, inclusion and [sustainability](#).

This report presents principles, frameworks, and guidance documents co-developed by students and staff to support colleagues across the sector when starting to prepare for the new academic year 2023/24. Considering that the umbrella term AI represents just some of many new digital technologies and that these have to be considered as part of a more holistic framework that includes people and processes, this report also aims to trigger a broader move towards digital transformation in education.

Acknowledgements

Warwick student representatives were integral to the groups' discussions and also produced their own findings. I would like to thank in particular the following students:

- ▶ Marie-Dolores Ako-Adounvo (Theme 1)
- ▶ Chaoran Yang (Theme 2)
- ▶ Yiran Xu (Theme 3)
- ▶ Molly Fowler (Theme 4)
- ▶ Mara Bortnowschi (Theme 5)
- ▶ Lichuan Xiang (Theme 6)

I would also like to thank WIHEA for supporting this important work and colleagues from within Warwick and the wider international community for their significant time commitment in the last six months to exchange views, provide guidance to other colleagues, and to develop the findings of this report.

Isabel Fischer, 12 July 2023

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Summary by Chapter

Part 1) Student Voice Key Findings

The main research findings from the student perspective highlight the following key insights regarding the application of AI in education:

- ▶ AI cannot be ignored and must be embraced in education as it is being embraced in the workplace and wider society.
- ▶ AI provides a new avenue of saving time on some work while spending more time on others, including personalisation of education and enhancing student engagement.
- ▶ Emphasising a holistic approach in education; AI as a complement to active engagement and independent thinking and not a replacement for the human brain: Creating an environment in higher education that fosters critical thinking and problem-solving, alongside AI utilisation, is recommended, recognising that AI is not infallible.
- ▶ Access to information generated by AI can bridge barriers and enhance understanding, promoting inclusive learning environments.
- ▶ Prioritising practical experience and lifelong learning prepares students for the evolving job market where AI will be utilised.
- ▶ Providing support for ethical considerations is important for students' AI literacy.

Part 2) Task and Finish Group Key Findings

Chapter 2.1: The AI-enhanced Learning Environment

Participants were acutely aware of the potential risks of AI, such as the credibility of assessments and the future integrity of university qualifications. The discussions of this strand focused on the potential overarching benefits of AI for learning, covering fundamental questions, such as 'what is AI' and 'what makes humans different to AI'. The strand found that rapid development of AI has created a deficit-excess problem in universities where some students have little knowledge of AI, while others are already using commercial AI products extensively in their studies. This led to concerns about educational inequality. The key message of this strand to university policymakers is to invest specifically in building human and physical capacity and capability to ensure all students and staff can play an active role in the development of the future AI landscape in education.

Chapter 2.2: Teaching of the Future

The discussions of this strand centred around the potential use of AI and some of the readily available AI tools that can be employed by educators and students alike using AI as a collaborative partner. The group explored the opportunities where the AI tools can be particularly used by mapping an *educator journey* and a *student learning journey* to identify the key touchpoints where the AI tools can serve as a co-pilot for both students and educators.

Chapter 2.3: Academic Integrity and AI Ethics

Participants emphasised the importance of protecting academic integrity and delivering a clear message to students regarding assessments. They recognised the need to establish transparent guidelines for students' use of AI, acknowledging AI's potential to support various aspects of the learning process. These discussions resulted in the following outcomes: 1. Building trust between educators and learners, 2. Acknowledging that AI tools are valid for studying and work, and 3. Providing guidance and support in utilising AI technologies to foster collaboration between educators and learners. Furthermore, the strand provided guidance that fed into draft university policy.

Chapter 2.4: Designing Assessments

Assessments need to consider the learning journey and not just the final output. Authentic assessments allow educators to harness the power of technologies while maintaining assessment validity and integrity. The principles of assessment design, including those outlined in the QAA guide on assessments, also apply to the use of technologies, including AI. Educators should be clear about when, where, and how AI can be integrated into assessments. When appropriate, assessments should promote AI literacy, preparing students for the future in terms of tools, concepts and ethics. Technologies,

including AI, should only be used if they enhance the pedagogical process and contribute to a comprehensive learning experience. Similar to Strand 3, this strand also provided guidance that fed into draft university policy.

Chapter 2.5: Dialogue and Feedback using AI

This group focused on the use of AI in marking and providing feedback on student work, with a particular focus on formative rather than summative assessment. The group discussed the issues currently faced by educators and students with regard to the marking/feedback process, and explored opportunities and dangers presented by AI. The chapter presents the group's reflections and recommendations, including links to reflective pieces and other useful resources that were shared by members of the group.

Chapter 2.6: Technical thoughts and further considerations on next steps.

In this chapter we outline the need for Warwick to start a holistic Digital Transformation journey to retain a competitive edge. We explain how adopting principles of Digital Transformation would be beneficial for AI in education. We discuss some of the current limiting aspects of developing in-house AI-based innovations for educational purposes.

Part 3) Additional contributions

In this section we provide additional relevant sections for the key themes

- ▶ Chapter 3.1 discusses the need to consider the underpinning skills an AI tool teaches when using it rather than the features the tools provides to the users.
- ▶ In Chapter 3.2 readers have access to an extensive list of useful links for AI in teaching and assessments.
- ▶ Chapter 3.3 briefly illustrates the broader remit of Ethics by reviewing aspects of data privacy.
- ▶ Chapter 3.4 provides an example from IATL of a student devised assessment.
- ▶ Chapter 3.5 outlines how generative AI can be used to support student-learning differently to how we would have done this in the past, first by discussing formative feedback before then explaining how to use it to produce tables that are particularly helpful for neurodivergent students.
- ▶ Chapter 3.6 explains how we could be building our own generative AI tools, first by showcasing an existing example in a research setting before outlining what is required to transpose this as a module's (or a programme / course) reading list.

Introduction and Methods



DALL-E 2, 2023a

Overview

Recently published [Russell Group University AI Guidance](#) sets out the principles on the use of generative AI tools in education. Similar to developing a roadmap to research using generative AI (see: [Sursarla et al., 2023](#)) universities and other educational institutions need to assess the impact that emerging AI has for pedagogy; for the way in which educators teach, for how students learn, and for how students' learning is assessed.

Developments in AI are fast-moving, and the growth of AI, in particular Foundation Models, are potentially exponential. This report provides a 'snapshot' in time of the thoughts and perspectives of a wide range of academic staff and students. It is written with the intention of providing useful resources and recommendations that might support practice and policy across the university while preparing for the start of autumn term, 2023/24.

The project began on 19th January 2023 and was conducted to support:

- ▶ Warwick's vision of learning beyond boundaries and increased student staff co-creation.
- ▶ The pedagogic aims and principles of Warwick's Academic Development Centre (ADC).
- ▶ Warwick's 2030 strategy, to ensure that, irrespective of background, disability, faith, gender, race and sexual orientation, all students have access to equal opportunities to thrive and progress at Warwick.

This interdisciplinary task and finish group, and its strands were led by the following team

- | | |
|---|---|
| ▶ Isabel Fischer (Lead) | ▶ Sam Grierson (Academic Integrity) |
| ▶ Leda Mirbahai (Co-lead, Assessments) | ▶ Lee Griffin (Ex officio Academic Integrity) |
| ▶ Lewis Beer (Dialogue with AI) | ▶ Neha Gupta (Teaching) |
| ▶ David Buxton (AI-enhanced Learning Environment) | |

Methods

The report emanates from several sources:

- ▶ Staff discussion groups taking place during the Spring and Summer terms, 2023. These involved a wide range of academic staff representing a variety of Warwick University departments, including some external academics from UK and overseas universities. Group discussions straddled five distinct themes.
- ▶ Feedback from linked student researchers who attended some of these Learning Circle discussions and who also canvassed wider student voice.
- ▶ Staff and student focus group discussions conducted during the Spring term 2023. The focus groups were used to elicit staff and student opinion about AI in higher education generally and specific feedback on an AI essay writing feedback tool developed and trialled by Warwick University Business School.
- ▶ Quantitative analysis of several student surveys on the topic of AI and AI for formative feedback.

Main Themes

The report begins with a Student Voice perspective on a range of AI topics and issues (Part 1). This is followed by the Learning Circle Task and Finish Group Voice (Part 2). A portfolio of standalone opinion pieces follows (Part 3). The report concludes by drawing together general recommendations and suggested next steps.

The work of each of the six Learning Circle groups comprises the following report chapters, each feed through the three parts of the report.

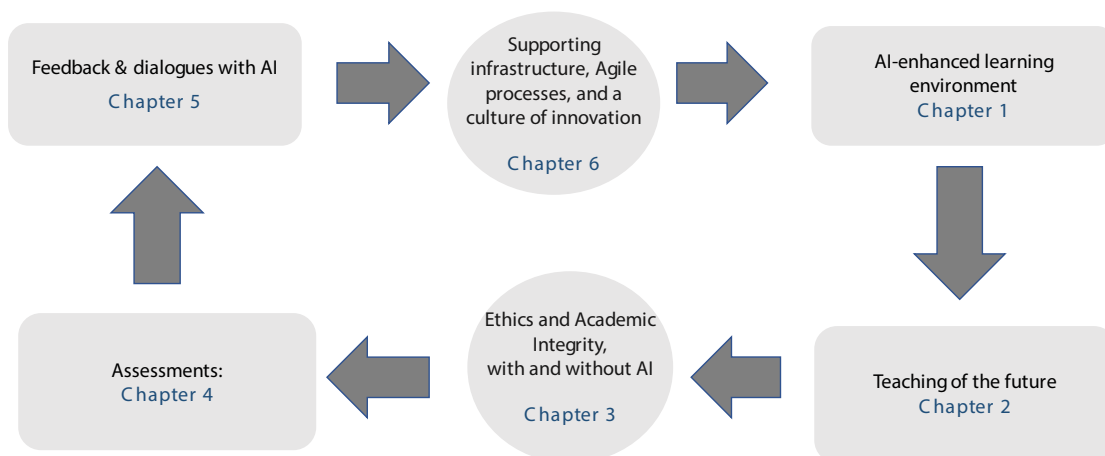


Figure 1: Theme and Chapter Overview

Chapter 1: The AI-enhanced Learning Environment: Asking fundamental questions of how AI is used and differentiating between ‘human’ and ‘machine’ skills.

Chapter 2: Teaching of the Future: Using AI to enhance teaching and learning, with AI being a collaborative partner, with recommendations of how educators who want to incorporate AI might do so and the resources they may wish to utilise.

Chapter 3: Academic Integrity and AI Ethics: Incorporating the use of AI into established academic ethics and codes of practice.

Chapter 4: Designing Assessments: How to use AI for assessment and developing AI assessment principles for colleagues who want to incorporate AI into assessment tasks.

Chapter 5: Dialogue and Feedback using AI:

Analysing case studies of AI use to enhance the learning process, with an emphasis on formative feedback, including personalised and tailored AI-generated dialogue.

Chapter 6: Implementing an infrastructure that encourages innovation.

Part 1: Student Voice

Chapter 1.1: Enhancing Education with AI

by Marie-Dolores Ako-Adounvo



DALL-E 2, 2023b

Summary

The research findings from the students' perspective highlight key insights regarding the application of AI in education.

- ▶ Emphasising a holistic approach, AI as a complement to active engagement and independent thinking.
- ▶ Creating an environment that fosters critical thinking and problem-solving, alongside AI utilisation, is recommended.
- ▶ Access to information can bridge barriers and enhance understanding, promoting inclusive learning environments.
- ▶ Prioritising practical experience and lifelong learning prepares students for the evolving job market.
- ▶ Integrating AI education and providing support for ethical considerations are important for students' AI literacy.

Background

The term "Digital Natives" coined by Marc Prensky (2001) describes the current generation of students who have grown up immersed in the digital language of computers and the internet. These students prefer hands-on experiences, and the integration of technology in their academic pursuits (Kvavik, 2005). The introduction of ChatGPT captured the interest of students, who have utilised its potential to support their academic endeavors. Universities' responses to this technology have varied, with some imposing restrictions for control purposes while others choose to embrace it (Manga, 2023). This section explores students' perspectives on the optimal utilisation of AI within universities.

General overview of AI from student's perspective

From the perspective of students in higher educational institutions, the integration of AI in education has garnered widespread appreciation. Students view AI as a valuable tool that enhances their efficiency and saves time. For programming students, tools like ChatGPT are particularly beneficial in understanding lines of code and reducing their reliance on instructors or online research for explanations. Moreover, students find AI useful for comprehending question requirements, organising thoughts and ideas, conducting research, and more. A study by Vasconcelos and Dos Santos (2023) supports this finding by highlighting the positive impact of AI language models like ChatGPT and Bing Chat on reflective thinking, critical thinking, creativity, problem-solving, and concept comprehension. Nevertheless, the issue of bias is also raised, as Open AI (2023) advises educators and students to be mindful of ChatGPT's potential to generate content that perpetuates harmful biases and stereotypes, even in subtle ways.

Does consistent use affect our intelligence or thinking ability?

Having discussed the benefits that AI presents, during the study, the potential influence of AI on students' intelligence and thinking ability emerged as a noteworthy consideration. Although AI tools offer numerous benefits, concerns were raised regarding the possibility of students becoming lazy, susceptible to plagiarism, and overly reliant on these tools. This is contrary to the finding by Vasconcelos and Dos Santos (2023) in the paragraph above which highlights the potential of these tools as "objects to think with". Participants shared multiple instances where they heavily relied on AI for tasks such as email drafting, CV tailoring and cover letter writing. It became apparent that AI had become the default choice for these activities. This raises the question of whether this dependence on AI should be a cause for concern and how it might impact students' creativity and their capacity for independent thinking.

Human vs machine thinking

During the discussion, the ability to differentiate between AI and human thinking emerged as a significant topic. Many students expressed the belief that distinguishing between the two would be challenging, as AI often produces work of comparable or even superior quality to humans. AI's capacity to gather information from diverse sources and present compelling arguments was acknowledged. However, students emphasised the inclusion of human emotions and emotional intelligence as a distinguishing factor. While AI's output relies solely on available data, humans possess the ability to anticipate, imagine, feel, and make judgements, enabling them to evaluate short and long-term situations (Cremer & Kasparov, 2021). Nonetheless, studies suggest that researchers are exploring the incorporation of emotional intelligence capabilities in chatbots through AI and Natural Language Processing techniques (Bilquise et al., 2022; Folstad & Skjuve, 2019), potentially diminishing this distinction.

It was also observed that most students lack full trust in AI to make ethical and moral decisions. Unlike AI, human decision-making considers factors beyond rationality, recognising that the most rational choice may not always be the best one (Johnson, 2021). This finding further emphasises the significance of human judgement in ethical considerations, particularly due to the presence of existing biases. Students highlighted the importance of incorporating human perspectives and values in decision-making processes that involve ethical implications.

Should universities revert, outrun or embrace AI?

Embrace due to Career Advantages and Employer Demand:

A predominant theme that emerged from our research is the widespread recognition among students that pursuing higher education is essential for gaining career advantages and securing better job opportunities. In light of this, many students strongly advocate for the embracing of AI in higher education institutions. They emphasise the increasing value employers place on AI skills, highlighting the potential competitive edge that AI knowledge can provide (PwC, 2020; Li, 2022; Neha, 2020). As IBM cloud and data executive Rob Thomas aptly stated, "AI will not replace managers, but managers who know how to use AI will replace those who don't" (Handley, 2020). This sentiment underscores the belief that embracing AI can lead to improved career prospects for students.

Embrace due to insights from AI exposure in Lectures

The exposure of some students to AI integration in their lectures has yielded valuable insights into the potential applications of AI within their desired industries. Through interactions with AI tools during their classes, students have developed some understanding of the limitations of AI in said contexts. Consequently, this experience has instilled greater confidence in their own abilities and enabled them to identify areas where human skills can truly excel. Students perceive AI as an augmentative tool that enhances their performance, rather than a complete replacement for human capabilities. This perspective strongly supports the case for embracing AI in higher education institutions, as it empowers students to leverage the technology's strengths while capitalizing on their unique human skills.

Embrace as a pragmatic approach and the inevitable integration

Finally, students expressed the view that regardless of their university's stance, the use of AI in academic

pursuits is inevitable. Embracing AI is seen as a more pragmatic approach, as reverting to traditional methods would be inconsistent with the realities of the modern world. Students recognise the need to adapt to the changing technological landscape and leverage AI as a critical component of their education and future careers.

Has AI helped with Inclusion?

In the context of universities with a diverse population of international students, varied age groups and abilities, it is very important that AI will promote inclusion. Below are some aspects for consideration.

Accessibility to information

One crucial aspect to consider is the accessibility of information about AI tools to all students. Many students mentioned that they learn about tools such as ChatGPT, and ChatPDF, through social media platforms like Instagram, TikTok, Twitter, YouTube, and the Little Red Book app. This suggests that the quality of the information that the students access, could depend on the accounts they follow. It also highlights the importance of students' IT literacy and mindset. Younger students who use these technologies more frequently than mature students may have an advantage, creating potential disparities (Staddon, 2020). In addition to this, investment in upgraded versions of the tools provides higher quality of information and output as compared to the free versions which most students have access to.

These factors underscore the argument for universities to embrace AI in order to provide a solid foundation for all students, irrespective of their abilities and access to information.

What makes a good student?

Another significant concern raised by students was that while AI has the potential to promote inclusion, it could also widen the gap. They questioned the standards by which a "good student" would be measured when AI is involved. With the aid of AI, an exceptional student with knowledge of how to leverage its capabilities could further excel, creating a larger disparity and increased competition between them and weaker students who may struggle to catch up.

Inclusion in writing and communication

Despite these concerns, AI as an augmentative tool was deemed highly beneficial in bridging the gap in language and writing skills. Some students who sought to improve their writing and grammar utilised ChatGPT plugins as editors. It provided an accessible means for enhancing the quality of their writing, compared to the previous requirement of booking tutoring sessions or relying on peers. Additionally, AI tools were found to be helpful in explaining complex topics and questions to students, aiding their understanding. In this regard, AI can be seen as promoting inclusion by assisting students in overcoming barriers and accessing educational resources more effectively.

Do students feel prepared for the world of work?

The discussions further examined students' perceptions of their preparedness for the world of work, with a specific focus on concerns related to the pace of AI development and its potential impact on job prospects. A key finding revealed that students harbour uncertainties arising from limited access to information, due to the rapid advancements of the technology as encapsulated in the expression "You don't know what you don't know." However, others who had first-hand experience with AI integration in their courses expressed higher confidence in their readiness for the workforce. These students gained valuable insights into AI's applications across diverse domains and recognised areas where human expertise can complement its limitations.

While students reported feeling adequately prepared for work, they acknowledged the need for continuous learning, recognizing the impossibility of possessing exhaustive knowledge. Furthermore, students expressed optimism about the emergence of novel job roles resulting from AI advancements,

citing the example of “prompt engineers” as a role that has recently surfaced.

What should next year’s Warwick students be learning about AI?

In preparing next year’s students for the challenges and opportunities presented by AI, it is essential to focus on key areas of learning. The following recommendations are suggested to enhance students’ understanding and utilisation of AI:

1. **Ethical Use of AI:** Students should receive comprehensive training on the ethical considerations associated with AI and its tools. This knowledge will empower students to confidently and responsibly engage with AI technologies and share their findings in an ethical manner.
2. **Incorporate AI into Course Curriculum:** Lecturers should ensure that course content remains up-to-date with the latest AI advancements and tailor it to different fields. For example, courses such as “Accounting in AI” can provide practical experiences and insights into how AI can be applied in specific domains.
3. **Managerial Applications of AI:** Students should explore how AI can be utilised in managerial roles. Modules can be designed to delve into the design principles of AI applications at different stages, such as the Stanford’s Design thinking framework x AI.
4. **In-Class Utilisation:** Lecturers should introduce and allow the use of AI tools in class to aid the learning process. Students can leverage AI technologies to enhance their understanding and explore complex topics with the guidance of their instructors.
5. **Emphasise Decision-Making and Information Gathering:** While AI tools like ChatGPT can bridge educational inequalities by providing a foundation for students, it is crucial to emphasise the importance of human decision-making and critical evaluation of information. Students should be encouraged to validate AI-generated outputs and make informed judgements.

By implementing these recommendations, the University of Warwick can provide its students with a comprehensive AI education that prepares them for the challenges and opportunities of an AI-driven future.

Concluding Advice for Educators

- ▶ Promote a holistic approach to AI usage in education, emphasising its complementary role rather than a substitute for active engagement and independent thinking.
- ▶ Raise awareness of the limitations of AI and provide guidance on responsible usage to mitigate negative impacts on students’ intellectual growth and creativity.
- ▶ Foster an environment that encourages the development of critical thinking skills and creative problem-solving, allowing students to effectively leverage AI while maintaining their ability to think and create independently.
- ▶ Embrace AI in universities to equip students with relevant skills for the job market and offer industry-specific applications.
- ▶ Create inclusive learning environments by utilising AI to bridge language barriers, improve writing skills, and enhance understanding of complex concepts.
- ▶ Prioritise practical experience and a commitment to lifelong learning to prepare students for the evolving job landscape.
- ▶ Incorporate AI education into curricula and support students in navigating the ethical implications and potential biases of AI.

Chapter 1.2: AI as a collaborative partner in the classroom

by Chaoran Yang

A Warwick University student perspective on how artificial intelligence (AI) might be used productively, safely and ethically in the higher education classroom.



Image created by Chaoran Yang, the student author of this chapter using Stable Diffusion, an AI drawing tool

Artificial Intelligence (AI) has the potential to revolutionise the field of education, partly by addressing the time constraints that hinder educators from providing personalised learning experiences. According to a survey by McKinsey (2020), educators spend an average of 50 hours on various tasks, with only 49% of that time dedicated to direct student interaction. The remaining time is allocated to preparation (10.5 hours), evaluation and feedback (6.5 hours), personal development (3 hours), and administrative tasks (5 hours). **In this chapter I explore how AI tools can assist educators in preparing and planning their module content possibly faster than before.**

Although the above-mentioned survey was based on the responses of K-12 instructors, it provides valuable insights into how AI tools might positively impact education. The suggested focus from my perspective is to value the time-saving potential of AI to allow educators to reallocate their time towards increased interaction with student and personalised instruction. **By utilising AI tools effectively, educators could potentially provide higher personalised quality instruction** while possibly also be able to reduce their workload to achieve a better work-life balance. This, simultaneously, leads to improved academic performance for students, creating a mutually beneficial and win-win situation. The survey findings from McKinsey present an idealistic scenario where time saved through the use of AI tools can be reallocated to interactive activities. However, it is important to acknowledge that the fixed lecture time in many educational settings, typically around 2 hours, can limit the extent to which educators can directly allocate saved time to student interaction. Given that, the focus shifts towards optimising the use of the available lecture time effectively and the importance of educators having detailed and well-thought-out module plans and sufficient preparation.

As per the journey maps outlined in Figures 1.2.1 and 1.2.2 below, students often desire educators who possess an understanding of their individual needs and can tailor their instruction accordingly during the preparation stage. To meet this expectation, educators can leverage the power of Large Language Models (LLMs) like ChatGPT and NewBing to effortlessly create questionnaires and collect students' responses, aiding in determining the focus of the course content. By combining the learning objectives of the subject with students' interests, educators can ensure a more engaging and relevant learning experience. Furthermore, it is recommended to conduct surveys during the reflection stage, enabling educators to gather comprehensive feedback on their modules. This integration of AI in education allows for a more efficient and systematic approach to gathering valuable insights, enhancing the overall effectiveness of the teaching and learning process. The example of Cognii, demonstrate similar potential with LLMs. With Cognii's Virtual Learning Assistant and Cognii Analytics, educators can effectively

collect students' responses. By leveraging the Virtual Learning Assistant, educators have the flexibility to modify the question setting, shifting from specific knowledge-based questions to inquiries aligned with the learning targets. For instance, educators can pose a question such as, "Which theme are you most interested in? A: How to create a mind map, B: Design Thinking, or C: The framework of a consulting proposal." The Cognii Analytics could automatically collect and analyse the students' responses to facilitate decision-making of educators.

Educator Journey Map (Student View)	Educators	Step 1 Discovery/Preparation	Step 2 In Lesson (Teaching)	Step 3 Q&A	Step 4 Activities/Quiz/group discussion	Step 5 Reflect
	What is the Educator's action?	<ul style="list-style-type: none"> Recording video Gathering information about different teaching methods Create lesson plans and prepare teaching materials 	Lecturing	<ul style="list-style-type: none"> Answer the questions Listening what students say 	Assess student progress, provide feedback, and mark assignments and exams.	Regularly reflect on their teaching performance, seeking feedback from students, colleagues, and supervisors.
	What is the Educator's thinking or feeling?	<ul style="list-style-type: none"> What is the key point of this lesson? How to deliver? What could students learn from it? How could it be more attractive? 	<ul style="list-style-type: none"> How could I know whether they are listening or not? What should I do if students just watching their Laptop or mobile? Have I make the points clear? 	<ul style="list-style-type: none"> Should I answer some questions irrelevant to the focus of this lesson? Why no questions? 	<ul style="list-style-type: none"> What should I do if some groups deviate from the discussion topics? Desire to improve if they perceive any disengagement or lack of classroom cohesion 	<ul style="list-style-type: none"> Did I provide the best learning experience for students? Did students really learn what I taught? How could I improve?
	What is the Educator's touchpoint?	<ul style="list-style-type: none"> Google Textbook/Cases Previous materials 	<ul style="list-style-type: none"> Lecture Slides Teaching aids 	<ul style="list-style-type: none"> Slides/Materials 	<ul style="list-style-type: none"> e.g. Venox Share documents 	<ul style="list-style-type: none"> Module Feedbacks Forums
	What do we want to change about this step?	Educators should aware the gap between What they teaching about and what students want to learn about	<ul style="list-style-type: none"> Pauses to ensure students are listening Use aids e.g. visual to attract students 	<ul style="list-style-type: none"> Avoid silence More involvement 	Promote interactive collaboration	Adapt their teaching strategies based on student needs.
	How and/or why will we make this change?	Ensure their teaching contents based on student needs and module specifications.	AI-based tutoring systems can provide real-time feedback and guidance enhancing the learning process.	<ul style="list-style-type: none"> AI copilot Example Q&A Use AI Chatbot give instant feedback 	AI-based sentiment analysis tools can assess student engagement and emotional well-being	AI analysis to collect feedbacks from students, and gain insights into their instructional effectiveness

Figure 1.2.1. Educators Journey Map (from the students' perspective)

Students Journey Map (Student View)	Students Journey	Step 1 Preparation	Step 2 In Lesson (Teaching)	Step 3 Q&A	Step 4 Activities/Quiz/group discussion	Step 5 Review
	What is the Students's action?	Watch pre-recorded video Read materials (Cases, Articles)	Listening lessons/ Writing notes	Asking questions/ Listening other students Q&A/ Silence	Engage in activities Lead the discussion Always listener, rarely speaker	Actively go through materials and further research Do nothing until they find themselves confused before deadlines
	What is the Students thinking or feeling?	<ul style="list-style-type: none"> What is this lesson about? What could I learn from it? Why should I prepare for this lesson? Does it have to be done? 	When students take notes they may miss some core contents(Confuse)	<ul style="list-style-type: none"> Ask too much questions (Others may don't have chance to ask) Ashd to ask questions 	<ul style="list-style-type: none"> What could we do/What are the possible answers? Listen to what others says/Is it correct? 	<ul style="list-style-type: none"> What is the key points of this lesson What do I want to learn more about? Anything about assignments and exams
	What is the Students's touchpoint?	<ol style="list-style-type: none"> Module Resources Reading List 	Lecture Slides/Their notes	Rise hand	Share document/ Cases materials	<ol style="list-style-type: none"> Module Reading List Google
	What do we want to change about this step?	<ol style="list-style-type: none"> Clear Structure Some Examples explain complex concepts More incentive mechanism encourage students pre-learn 	Promote active listening	Avoid silence More students involvement	Guidance of exercises/ Everyone could share their points	Encourage students to recap after the lesson
	How and/or why will we make this change?	4 Auto email when students finished	More interactive sessions	AI copilot Example Q&A	Use ChatGpt to transform leading to further discussion	New edition of PPT (including some notes of educators)

👤 : Active students 🙄 : Passive students

Figure 1.2.2. Student View of the Students Learning Journey

The highlighted areas indicate aspects where AI tools can be readily employed for enhanced teaching and learning experience.

Two further examples

Knewton *Alta* is an AI-powered adaptive learning courseware that empowers educators with a comprehensive solution tailored to their specific learning objectives. It encompasses a range of contents, including instructional text, videos, and examples, while also offering assessments and feedback. Through its adaptive learning technology, *Alta* delivers a personalised learning experience to students, continuously measuring their proficiency levels and providing adaptive feedback. Currently, *Alta* offers courses in Biology, Chemistry, Calculus, Math & Statistics, Physics, and Psychology (Knewton, 2018). Potential use case: The core competitive advantage of *Alta* is its adaptive learning technology, facilitating students reach the target set by educators. Therefore, *Alta* could be a suitable tool for designing and creating pre-study modules. By leveraging *Alta*, educators can save valuable time on developing core modules, while ensuring that all students possess a solid foundation of knowledge in their respective core subjects.

Cognii is an integrative AI-powered education tool that offering *Virtual Learning Assistant* for students and *Cognii Analytics* for instructors (Cognii, 2023). Interestingly, the *Cognii's Virtual Learning Assistant* takes the form of an interactive Chatbot. This innovative assistant engages students by asking questions and delivering personalised feedback. By leveraging AI technology, Cognii enables students to receive tailored support and guidance throughout their learning journey. In addition, Cognii offers an AI-powered online course design tool for educators. This tool streamlines the process of creating structured course content and assignments. When combined with *Cognii Analytics*, educators gain valuable insights into students' performance and can provide customised solutions to address their individual needs. Potential use case: The *Cognii's Virtual Learning Assistant* could be utilised to facilitate students' engagement of Q&A in class and provide auto reply in the forum of modules.

Chapter 1.3: Academic Integrity and AI Ethics

By Yiran Xu

Summary

GenAI is generic tools that only generate recycled information:

- ▶ Accuracy and relevance should not be assumed but carefully confirmed.

GenAI generates no insights:

- ▶ Human's cognitive capability is unparalleled in producing real understanding and novel insights.

GenAI generates no knowledge:

- ▶ Take responsibility in your own learning.
- ▶ Refuse AI to overpower your chances to thrive and succeed.

GenAI generates no wisdom:

- ▶ Equip yourself with knowledge and skills to navigate AI tools effectively and responsibly.

Background



A student-sourced image with copyright to be confirmed

With the advent of ChatGPT3.0, the current generation of higher education students are being exposed to a diverse range of generative AI tools. While many are fascinated by the seemingly astonishing usefulness of such tools, more students feel less at ease with their presence. The prevalence of Generative AI Tools

(GAITs) appears to create a spectrum where two extremes emerge: on one end, students are lured to rely on AI as their primary tool to gain an edge, while on the other end, AI cultivates self-doubt and raises existential questions – “where does it leave me?”

Opinion Piece

Generative AI Tools (GAITs) usher in a new era for higher education (HE). While the hype of GenAI might be debatable, the impact on students and educators is evident. On one hand, we see the opportunities for both students and educators to perform routine tasks more efficiently. For example, ChatGPT is frequently used and widely accepted as an efficient tool for composing emails and editing manuscripts. On the other hand, it poses unforeseen challenges for traditional way of learning and assessment. For example, students are suspected to be using ChatGPT and other Large Language Models to write written assignments, which renders the assessment as an opportunity to learn pointless. What is more concerning is the potential long-term impact of GenAI on the ownership and identity of human content creators. For example, students have fears and concerns about their future role as a junior employee if ChatGPT can perform many tasks “perfectly” that would have been in their job description.

On account of these risks and challenges, universities across the globe are taking actions to either ban ChatGPT or revising their plagiarism policies to restrict its use. Setting aside the pointless gesture of banning one generative AI tool, for there could be a hundred more being released next week, the act itself may backfire for the benefit of students. Taking knowledge out of the equation, universities can be understood as the supplier of a commodity – higher education degree. Students have demands for such a commodity to improve their future employability. If history were to repeat itself (and it usually does), just like the internet and smart mobile devices, AI is here to stay. In the world penetrated by AI, organisations today and in the future will inevitably seek and select employees that can help them capture the value of AI. In the increasingly congested and competitive graduate labour market, forbidding students from using AI may impede their opportunities in the digital era.



A student-sourced image with copyright to be confirmed

I'd like to call this the burying-head-in-the-sand approach, for it alone will not prevent students from working around the ban, it will not prevent GAITs from becoming prevalent in content generation in the real world, and as a consequence, it will not be preparing the students for surviving and thriving in the current labour market. Albeit an easy way to navigate through the emerging ordeal that is GenAI, this approach may cultivate an environment where students with the access and means to get past the rules to gain an unfair advantage over other students. To ensure against this, universities should provide the experiences that can add value to every student's future employability, we need to pop the balloon, stop hiding this new technology vainly, and start understanding it together with our students.

To quote my favourite writer – Dan Brown, “*What we don't understand, we fear. What we fear, we judge as evil. What we judge as evil, we attempt to control. And what we cannot control...we attack.*” Therefore, in order to unpack the attack, the attempts, the evilness, the judgement, and the fear, university should guide the students to understand GenAI. What is it? What can it do? What can't it do? What tasks can humans do better therefore should not let it do? What is it not supposed to do? Only then may we start the conversation of **how** to use it both effectively and responsibly.

Examples



Figure 1.3.1 Students' response after taken a 1-hour lecture on responsible AI.

Concluding Advice for students

- ▶ GenAI is a generic tool that only generates recycled information, no insights, no knowledge, and certainly no wisdom.
- ▶ Using GenAI requires scrutiny. Fact checking, yes, but more importantly, don't allow it to undermine your own cognitive capabilities.
- ▶ The true value of AI lies in its responsible use.
- ▶ University policy on academic integrity serves not only to ensure fair assessment, but also to safeguard the quality of your learning. Incorporate AI into your learning journey but do not surrender your chances to learn and grow.
- ▶ AI itself will not replace your job; rather, it is the people who possess the ability to harness and utilise AI effectively who will ultimately take over your job. Therefore, starting today, equip yourself with the knowledge and skills to navigate AI effectively and responsibly.

Chapter 1.4: Novel assessment design using AI

By Molly Fowler

In addition to the short opinion piece below, Molly Fowler has published a [recorded presentation](#) where she explores the use of AI in assessments.

Embracing AI in assessments seems valuable and is likely to lead to a paradigm shift in education. It requires practical in-class teaching on how to use AI and a discussion on the ethics of using and reporting it in both formative and summative assessments. Universities need to consider access to the technology and how changing assessments to include AI may lead to inequity. Students with disability, low-income, or international students are most likely to be adversely affected. Assessments designed to use AI should acknowledge some of these disparities and provide everyone with equal opportunities to succeed.

AI has progressed significantly in a short space of time. Arguably, assessments that fail to incorporate the use of AI will not reflect the learning environment and might therefore be less useful for students' learning. Course level learning outcomes may need to be adjusted to include AI competency to support restructured assessments. Assessments should be scrutinised for their contribution to an individual's 'learning journey' to reduce the burden of assessments on students and staff, particularly when adding AI-related learning objectives. Similarly, AI should only be implemented if it makes 'pedagogic sense'

but clandestine use of AI by students to subvert assessment needs should be recognised and either the assessment should be discarded or overhauled to embrace AI. Ignoring the influence of AI on assessment or reacting defensively will leave students unprepared for professional settings where AI is used, and may fail to combat academic malpractice effectively.

Chapter 1.5: AI Feedback Systems

By *Mara Bortnowschi*

The buzz is endless – AI is taking Higher Education by storm. Since the launch of ChatGPT, everyone seems to have an opinion, and rightfully so. It's so new and we have yet to fully understand its potential and the impact it will have. Within academia, the general sentiment mostly surrounds concern for responsible use, as many students have heard their professors and lecturers warning them against its use. However, its rapid growth and widespread adoption demonstrate that it's not going anywhere soon so instead of avoiding it, it should be given the time of day to understand the risks and challenges but also the opportunities it presents. Furthermore, I think the student voice in these discussions has been underrepresented, but really students can be the key to harnessing this technological advancement as an asset to enhancing learning and education.

The WIHEA group have already explored a number of subjects regarding AI in education from student perspectives. These have included emerging questions AI presents, the risks and ethics of academic integrity, evolving assessment styles to mitigate and integrate AI into assessment and how teaching may evolve. I will now explore some of the opportunities that are being presented with the widening availability and access to AI tools for students to enhance their learning and to generate formative feedback. While summative marking has been and continues to be required to be marked by human markers according to the UK Quality Code in Assessment (UKSCQA, 2018), formative feedback has more flexibility, and we are now presented with an opportunity to test and utilise the capabilities of these AI technologies in providing timely, constructive, and developmental feedback.

Existing feedback systems

This notion will be particularly explored in regard to formative elements of summative assessments. Feedback should allow a student to understand strengths and weaknesses of their work and if engaged with effectively, can be used to improve academic performance, and thus learning. Especially throughout the pandemic, we have seen the role of feedback change massively: as more of education has shifted online and reliance on formative assessments has increased as assessments *for* learning. This is in contrast to summative assessments which represent assessment *of* learning (Wyatt-Smith, Klenowski and Colbert, 2014). Formative assessments also are an opportunity for autonomous learning by developing one's own skills and relying on self-motivation. It would also be fair to say that formative feedback can be self-assessment of sorts, as even though the formative feedback is generated externally, it is the engagement with, and learning you apply from it that will ultimately make a difference in each student's performance.

AI generated feedback

So what could incorporation of AI in these feedback systems change? Well, the use of algorithms in the generation of feedback is not an entirely new concept. Algorithms, such as Grammarly and Sketch Engine, have been around for a while and they can generate feedback on academic writing and are, for the most part, freely available, or students are granted access to them by their institutions. But with more complicated algorithms that use machine learning, we can apply them to provide specific and personalised feedback. To make this even more applicable, by integrating what could be different elements of summative marking criteria or rubrics, they could provide some of the most relevant feedback at a moment's notice.

This application is indeed being explored right here at the University of Warwick. Isabel Fischer is leading a project team that piloted a deep learning formative feedback tool that has the potential to provide students formative feedback on demand. By simply submitting a pdf or Word document the

algorithm produces a document of in-depth feedback. While currently designed as purposefully generic, in my opinion, this could be just the start of developing department-specific feedback tools tailored to department-specific assignments, marking criteria, and writing styles for drafts of academic writing. While there are definitely some considerations to look out for, this is fascinating and shows great promise as a tool to increase student autonomy in adapting how they might approach assignments to still have the opportunity to personally benefit from formative feedback on their own writing.

Considerations of using generative AI

The considerations I mentioned earlier are worth discussing as students are turning to generative AI technologies like ChatGPT more and more. While these technologies are being developed to simulate human intelligence, there are some things they are simply not capable of. For example, AI technologies lack expressions or expressive language. If using them to generate feedback on your writing, you should be aware that they will not always be able to grasp the nuances or expressive language in that writing. In other words, any feedback you receive from AI should be approached critically. You should decide what you implement from feedback you receive, and you are responsible for identifying and understanding what can improve your work. This is all part of the responsible use of AI, but also applies to human-generated feedback. Your assignment, at the end of the day, will still be marked by a human marker with in-depth subject-specific knowledge and skills that they are asking you to learn and demonstrate in your assignment. I think the quick and uncritical way some people have exploited resources like ChatGPT, where they do not doubt or question any response it has generated and then simply implement the feedback into a piece of work, only to find that its references are wrong or just don't exist is highly irresponsible. Firstly, this should not be the way we utilise AI, as this is blatant plagiarism, but secondly, a critical approach should be used to verify references, and critically understand that the way AI answers can lack certain elements of context. Regardless, the point still stands: responsible applications of AI technologies should not be about using it to do your work, but using them to enhance or improve your outputs.

Engagement with AI technologies and feedback

A new level of engagement with AI has been seen since the release of ChatGPT and DALL-E. Perhaps this is rooted in the great advancement that this represented or, more sinisterly, the opportunity to exploit the technology to minimise workload. Regardless, everyone's interest has been piqued, and the level of engagement has been massive, exceeding what anyone might have expected, particularly from students. At the University of Warwick alone, students have made a total of 850,000 total site visits to ChatGPT in the first two months only on the university's Wi-Fi (SWNS, 2023). I think it's important to try to understand why this might be so in order to be able to channel this traffic for good rather than fearing an alleged 'cheating epidemic' that the media has been dubbing it.

In contrast to the older algorithm technologies that have been around for some time, like for example the previously mentioned Grammarly and Sketch, which experienced much more moderate levels of engagement and use. Reasons vary from lack of awareness, to limited breadth of feedback to language, or to lack of confidence in the feedback they provide. AI has surpassed many of these limiting factors in that it is capable of generating a wider breadth of feedback that can include language, style, structure and more. The confidence in the feedback it produces is reinforced by the continuous concern from educators. If professors are afraid AI technologies can be used to write entire assessments, then they must be capable of doing so.

Further benefits

As a result, we have seen students be more open to trying to use ChatGPT, and I think we should utilise this eagerness in a way that encourages students to enhance their academic achievements. By introducing resources such as Isabel Fischer's feedback tool or teaching students how to formulate prompts for ChatGPT to generate similar constructive feedback, we can guide a smooth integration of ChatGPT into Higher Education practices. And there are so many more benefits we have yet to see. For one, this alleviates a massive workload for staff. If such tools are available to take care of writing style and structure, staff's role in formative feedback can remain more focused on content. The speed

(or even instantaneity) with which AI can produce feedback also makes feedback more accessible. Furthermore, students can engage with it as many times as they like, inputting multiple drafts, as they are less limited by staff work capacity. Also, different students work on different timescales and with different approaches when faced with an assignment. This further widens accessibility to students that might begin assignments later than what might normally be a formative deadline. Communicating these advantages is key in order to achieve these outcomes and to harness this technology towards enhancing educational experience for both staff and students.

Conclusion and personal experience

In my experience thus far with using ChatGPT, I have had mixed feelings. On the one hand, I am very apprehensive of the fact that its use is quite contentious at the moment, with some professors explicitly prohibiting its use or consultation. On the other hand, it is a resource that is available and it feels foolish not to use what is at your disposal. Throughout the research that went into this article and discussion with faculty members about its potential to provide feedback, I have been introduced to a very clearly constructive way to engage with ChatGPT, that seems to satisfy both staff and students. While we are still in the early stages of understanding the potential and risks of generative AI technology, this is a tool that will have implications for Higher Education and we are being faced with the possibility of either embracing it, in various ways such as to generate formative feedback, or letting it escape our control at the cost of academic integrity, because it is clear that prohibiting its use will not prevent people from exploiting it. Finally, for further reading please visit [my recent blog post](#).

Chapter 1.6: Building technical in-house capacity and capability that allows universities to embrace AI

By Lichuan Xiang, final-year Computer Science PhD candidate at the University of Warwick

Building effective in-house AI capabilities in universities necessitates several critical factors:

- ▶ Establishing an effective AI strategy which incorporates recent advancements in Large Language Models (LLMs).
- ▶ Utilizing LLMs to streamline resources, enabling efficient and cost-effective operations.
- ▶ Fostering interdisciplinary collaborations and continuous learning initiatives to maintain AI expertise and adaptability.
- ▶ Establishing a comprehensive data management and governance framework to secure and effectively leverage the vast data processed by LLMs.
- ▶ Advocating for and instituting practices of AI ethics and responsible AI use to ensure transparency and fairness.

The strategic integration of LLMs can offer significant benefits in the educational realm, from enhancing student engagement and personalisation to aiding in administrative tasks and research activities.

Establishing an effective AI strategy which incorporates recent advancements in Large Language Models (LLMs)

Large Language Models (LLMs) like GPT-3 and GPT-4[1] are transformative tools in artificial intelligence. These models are trained on a vast corpus of text data, enabling them to generate coherent and contextually relevant text based on the input they receive. The 'large' in their title refers to the sheer size of these models, with billions, or even trillions, of parameters.

In education, LLMs are seen as having immense potential especially due to their ability to understand and generate human-like text that allows LLMs to create interactive and engaging learning experiences for students, including providing personalised feedback [5].

Generative models, which include LLMs, are AI models that can generate new data that resemble the data they have been trained in. These models have the potential to revolutionise many aspects of education. From creating customised learning materials and real exam questions to simulating complex real-world scenarios for experiential learning, the potential applications of these models in education are vast and

largely untapped. Combining LLMs and other generative models could lead to more personalised, engaging, and effective educational experiences.

Utilising LLMs to streamline resources, enabling efficient and cost-effective operations

Emergent abilities [2] in AI systems have become a focal point of interest due to the unexpected skills that AI models develop during their training. Not explicitly programmed into the system, these skills emerge spontaneously, often leading to surprising and novel capabilities. This is particularly evident in Large Language Models (LLMs) like GPT-3 and GPT-4, which can generate impressively human-like text and exhibit capabilities such as generating code, writing poetry, and even answering complex questions across various topics.

When dealing with tasks that benefit from LLMs' capabilities, the challenges associated with their size and complexity become evident - substantial computational resources are required, making them less accessible for institutions with limited resources. This is where techniques like transfer learning and knowledge distillation become crucial.

Transfer learning [3] allows a pre-trained model, which has already been trained on a large, diverse dataset, to be fine-tuned for a specific task using a smaller amount of task-specific data. This means you can leverage the knowledge acquired by these large models without training them from scratch.

Knowledge distillation [4], on the other hand, is a process where a smaller model is trained to mimic the behaviour of the larger model. The smaller model, often referred to as the student model, learns to reproduce the output of the large model, known as the teacher model. This technique allows us to compress the knowledge learned by large models into smaller ones.

By leveraging transfer learning and knowledge distillation, institutions can effectively harness the emergent abilities of LLMs in a streamlined and resource-efficient manner. This allows more organisations to benefit from the power of LLMs and is an essential strategy for democratising AI and making it accessible to a broader audience.

While the advent of AI and LLMs has brought about remarkable capabilities and opportunities, it is crucial to recognise that they are not a panacea for all tasks. Often, the decision to use AI or LLMs should be carefully considered against the specific requirements of a task, the availability of resources, and the desired outcome.

In certain situations, particularly in controlled environments, blending traditional machine learning and statistical methods with prior knowledge can result in more precise outcomes. This is particularly true for tasks where the problem space is well-defined, the patterns in the data are relatively stable, and the data itself is manageable and complex [6]. In such cases, a well-implemented linear regression, decision tree, or Bayesian method [7], for example, may outperform a complex AI model in terms of both accuracy and computational efficiency.

Moreover, traditional methods have the added benefit of interpretability - it is often easier to understand why a decision has been made with these models compared to more complex AI systems. This transparency can be crucial for tasks where interpretability and understanding the decision-making process are essential.

Therefore, it is essential to have a balanced perspective. AI and LLMs undoubtedly offer impressive capabilities and can solve complex problems that were once considered unapproachable. However, it is crucial to remember the value and effectiveness of traditional methods. In the proper context, a hybrid approach that judiciously combines AI with these traditional methods can lead to optimal outcomes, precision in results, and significant reductions in computational resources. Thus, the choice of tools should always be guided by the task at hand, considering both the requirements and constraints of the specific scenario.

Fostering interdisciplinary collaborations and continuous learning initiatives to maintain AI expertise and adaptability

Given the dynamic nature of AI, it is crucial to maintain a culture of continuous learning and improvement. As AI technology evolves, so must the institutions that use it. This means continually updating AI models based on the latest research and developments, adapting them to changing student behaviours and course designs and learning from their implementation.

In the context of LLMs, this could mean fine-tuning these models based on student interactions, course feedback, and learning outcomes. If a model is not effectively engaging students or not supporting a course's learning objectives, it may need to be adjusted. This requires a commitment to continuous learning and adaptability, underscoring the importance of AI expertise within the institution.

In sum, universities seeking to build in-house AI capacity should strive for interdisciplinary collaborations and cultivate a continuous learning and improvement culture. This approach ensures that AI models, including LLMs, are continually updated and improved to best serve the students and the institution's educational goals.

Establishing a comprehensive data management and governance framework to secure and effectively leverage the vast data processed by LLMs

Data is the lifeblood of AI and Large Language Models (LLMs). The quality and quantity of data available to them significantly influence the effectiveness of these models. However, with the vast amounts of data processed by LLMs, there arises a need for robust data management and governance frameworks.

In universities and educational institutions, this data often contains sensitive information about students, their behaviours, and their learning progress. As such, the security and privacy of this data are paramount. An in-house AI solution offers a significant advantage as it can provide more data security control than third-party AI services.

Using in-house AI allows institutions to control where and how the data is stored, processed, and used. The data can be stored on-premises or in a private cloud, reducing the risk of data leakage or misuse. In contrast, third-party services might require transferring data to the service provider's servers, which can pose additional risks.

Moreover, an in-house AI solution allows universities to develop customised data governance policies that align with their specific needs and legal requirements. This can include rules on data access, usage, retention, and deletion, as well as data anonymization and encryption protocols. These policies can ensure that the vast data processed by LLMs is managed effectively and securely.

However, building and managing an in-house AI solution also requires a significant investment in resources and expertise. It demands a skilled team to develop and maintain the AI models, manage the data infrastructure, and enforce the data governance policies. Universities should weigh these considerations against the potential benefits when deciding between an in-house or third-party AI solution.

In conclusion, establishing a comprehensive data management and governance framework is essential when working with LLMs, especially in sensitive environments like education. While this can be a complex task, an in-house AI solution can provide more control and security, making it a worthy consideration for universities and educational institutions.

Advocating for and instituting practices of AI ethics and responsible AI use to ensure transparency and fairness

In the deployment of AI, and particularly in sensitive contexts like education, it is crucial to advocate for and institute practices of AI ethics and responsible AI use. Universities and other educational institutions have a particular responsibility in this regard, both in their use of AI and in the education of future AI practitioners.

Ethical AI use involves a variety of principles. At its core, it is about ensuring that AI systems are used in a way that respects human rights, values, and legal standards. This can involve considerations around transparency, fairness, privacy, and accountability.

Transparency is essential as it allows users to understand how AI systems make decisions. In the context of LLMs used in education, clarifying when a language model is being used, what data it was trained on, and how it generates its outputs. This not only helps students and educators understand AI, but it can also facilitate informed decision-making and foster trust in the technology.

Fairness ensures that AI systems do not reinforce or create new biases. This can be particularly challenging with LLMs, as they are often trained on large datasets that can contain biases present in the source data. Universities should therefore take care to regularly audit their AI systems for biases and address any issues that arise.

Responsible AI use also involves ensuring the **privacy** of students and other users. As mentioned earlier, LLMs often process large amounts of data, some of which can be sensitive. Universities should have strict privacy controls in place to protect this data, and they should communicate these measures clearly to users.

Furthermore, responsible AI use involves **accountability**. Universities should be prepared to answer for the decisions made by their AI systems and to address any negative impacts. This might involve setting up a review process for AI-related decisions or creating a channel for users to report concerns or issues.

EU AI Ethics Framework	EU Explanations	Broad areas (Jobin et al.)	Google
1 Human agency and oversight	Fundamental rights, human agency and human oversight	Non-maleficence	Accountable to people
2 Technical robustness and safety	Resilience to attack and security, fall back plan and general safety, accuracy, reliability and reproducibility	<i>(underpinning various categories)</i>	Safe & Scientific excellence
3 Privacy and data governance	Respect for privacy, quality and integrity of data, and access to data	Privacy	Privacy design
4 Transparency	Traceability, explainability and communication	Transparency	<i>Transparency and explainability not explicitly included</i>
5 Diversity, non-discrimination and fairness	Avoidance of unfair bias, accessibility and universal design, and stakeholder participation	Justice and Fairness	Avoid Unfairness / Biases
6 Societal and environmental wellbeing	Sustainability and environmental friendliness, social impact, society and democracy		Socially beneficial
7 Accountability	Auditability, minimisation and reporting of negative impact, trade-offs and redress	Responsibility	Accountable to people etc. and 'Available for uses that accord with these principles'

Figure 1.6.1 Fischer (2023): Ethical principles

In conclusion, advocating for and instituting practices of AI ethics and responsible AI use is critical to adopting AI in a university setting. Through transparency, fairness, privacy, and accountability, universities can ensure that their use of AI, including LLMs, is effective but also ethical and responsible.

Part 2: Task and Finish Group Findings

Chapter 2.1: The AI-enhanced learning environment: some big questions

Findings based on group meetings led by David Buxton



DALL-E 2, 2023c

Summary

Participants were acutely aware of the potential risks of AI, such as the credibility of assessments and the future integrity of university qualifications. The discussions of this strand focused on the potential overarching benefits of AI for learning, covering fundamental questions, such as 'what is AI' and 'what makes humans different to AI'. The strand found that rapid development of AI has created a deficit-excess problem in universities where some students have little knowledge of AI, while others are already using commercial AI products extensively in their studies. This led to concerns about educational inequality. The key message of this strand to university policymakers is to invest specifically in building human and physical capacity and capability to ensure all students and staff can play an active role in the development of the future AI landscape in education.

Background

When taking the definition of AI as '**Machines that perform tasks normally performed by human intelligence, especially when the machines learn from data how to do those tasks**' (REF Government's National AI Strategy: <https://www.gov.uk/government/publications/national-ai-strategy/national-ai-strategy-html-version>), AI seems to have the potential to transform education with a risk that AI-generated content becomes ubiquitous, making it very difficult to distinguish between student and AI generated content.

This strand considered

- ▶ areas where AI and ML might bring positive solutions to broad challenges faced within education.
- ▶ potential approaches to AI; including the strengths and weaknesses.
- ▶ the way in which human and AI 'thinking' are different in kind and the implications this may have for learning and assessment.

The Potential Benefits of AI for Education

Reflecting optimistically upon what we might wish AI to achieve on a global educational canvass, several significant potential benefits were identified, with, for example, using AI to

- ▶ democratise knowledge, skills, and competences, bringing about greater empowerment of the learner.
- ▶ break down barriers towards learning and to open access.
- ▶ widen global access to education, thus expanding the potential 'classroom'.
- ▶ support differentiated learning at the learner's desired pace.
- ▶ save time for educators and learners, enabling time to be more appropriately re-focused.
- ▶ support the crucial teacher/student pedagogical relationship centred around formative feedback and assessment.

Why 'embrace' AI?

Three stances in relation to AI were considered (Abdullah Arabo 2023): Revert, Outrun, and Embrace.

1. **REVERT** - For summative, high-status assessments; return to unseen, closed book exams in controlled environments and/or verbal assessments or vivas in which students are asked to justify and defend their responses.

Benefits of this approach are that it protects the integrity of the learning and assessment process and the valued status of a university degree qualification and that it enables the educator to test out the 'zone of proximal development' (Vygotsky 1978) in a student's learning.

Downsides of this approach are:

- ▶ The viva approach is time-consuming, labour-intensive and therefore costly.
- ▶ The exclusive use of closed book type examinations excludes important skills that can be developed and tested via other forms of assessment such as coursework or dissertation.
- ▶ A monolithic, closed book assessment model does not accommodate the wide variety of learning styles.

- 2) **OUTRUN AI** - try to stay one step ahead of AI, basing assessment around highly contextualised and/or current and/or practical assessments and/or distinctively human cerebral skills, which can differentiate the human mind from AI.

Benefits of this approach are:

- ▶ It crystallises and assesses uniquely human thinking skills which are not (yet) accessible to AI.

Downsides of this approach are:

- ▶ AI may have already developed to such a degree that it has equalled or surpassed the human brain.
- ▶ It may be impossible or impractical for educators to differentiate accurately between work produced by a human or a machine. The quality and plausibility of AI responses (particularly text and algorithms but not yet graphical or pictorial representation) can now pass the Turing Test (Turing 1950) with ease and therefore AI detection tools are unreliable.

- 3) **EMBRACE AI** - embrace AI as an enabler. Recognise that the AI genie is now out of the bottle and allow students to legitimately use AI, otherwise AI will become a tool of malpractice. The parameters for the use of AI by students would need to be clearly set in an open and transparent way, recognising that AI can support different elements of the learning process, but that AI is neither infallible nor unbiased.

Recently published Russell Group University AI Guidance sets out principles on the use of generative AI tools in education and further guidance about how AI might be embraced (https://russellgroup.ac.uk/media/6137/rg_ai_principles-final.pdf).

Benefits of the 'Embrace' approach are:

- ▶ It is pragmatic and recognises the potential benefits AI and ML can bring to education rather than ruling them out per se.
- ▶ It fosters a relationship of trust between the learner and educator.
- ▶ It recognises that AI is now a legitimate area for study and investigation and that an important part of a university's role is to prepare students to use AI confidently and responsibly when they enter the workplace.

The views of teaching staff and students towards AI were varied, as one might expect. Though neither the challenges nor the opportunities of AI are exclusive to either staff or students, particular concerns of teaching staff relate to:

- ▶ the use of AI as a form of cheating or examination malpractice and the corrupting effect that this might have on standards.
- ▶ AI eroding the integrity and values of higher education and the value of a university degree. One staff member described AI as 'an existential threat to what we do' and another stated 'just because it exists, I don't think that's a good enough justification to just embrace it.'

- ▶ a concern that AI will encourage students to bypass the essential skills of scholarship that university education seeks to inculcate.
- ▶ concerns that AI is now driving pedagogical debate.
- ▶ concern that to embrace, or not to embrace, AI could widen educational inequality.

Students were generally more positive than teaching staff about the possibilities for the use of AI in higher education, with some even countenancing the use of AI in a summative assessment context, however particular concerns expressed by students were:

- ▶ students exploiting AI in undesirable ways if it isn't controlled and regulated.
- ▶ AI being used as a substitute for personal access to their tutor.
- ▶ AI being utilised by universities for economic reasons and thereby calling into question the value for money of an already very expensive university education.
- ▶ a potential double standard if academic staff are permitted to use AI and students are not.
- ▶ the perception that in using AI they (students) were being viewed as 'lazy'.

Conversely, teaching staff regarded the possible advantages of AI as:-

- ▶ creating an opportunity to revisit the purpose of education and how it should prepare students for the future changing world.
- ▶ creating an opportunity for university to redesign its assessment methods, for example, moving to more problem-based learning.
- ▶ an adaptive learning tool that can support independent learning.
- ▶ a tool that could be adapted to support formative assessment, though staff expressed far more reticence about the role of AI in summative assessment.

Students focused on the following possible advantages of AI in higher education: as a-

- ▶ tool to give tailored, specific feedback and guidance on how to improve.
- ▶ 'brainstorming tool' to generate ideas quickly and time-efficiently.

Areas of convergence between teaching staff and students regarding AI in higher education are:

- ▶ The urgent imperative for the university to agree policy and practice in relation to AI and, particularly regarding AI and assessment.
- ▶ The potential for exploring the use of AI within the university in a formative (low risk) assessment context, though some staff members would wish to resist the advance of AI in higher education entirely.
- ▶ The need for the university to disseminate AI information to educate staff and students.

Human and AI 'thinking' - different in degree or kind?

The Outrun Approach characterised above is reliant upon the continued existence of uniquely human reasoning skills. This has been characterised by some (McKain 2022) as Artificial Intelligence vs Wisdom or Artificial Wisdom (Williams and Shipley 2021) vs Human Intelligence or Human Wisdom (Jeste et al 2020; Wang 2014). Hao-bi (2014) defines wisdom as 'the integration of good moral-humane quality and high intelligence.' 'Artificial Intelligence is great on the intelligence side - thinking logically, conceptualising and linking the ideas it has in its database, but human beings have the additional advantage of wisdom - wisdom to connect new ideas creatively, or to use past experience to give new insights on existing concepts - I think, ultimately, we are trying to develop wise learners, not just intelligent learners' (Gemma Grey, Warwick Staff, 2023).

Put simply, Artificial Intelligence can provide and even be considered to convey information, think logically, and conceptualise and structure ideas. However, it takes human wisdom to use that information to demonstrate insight and understanding and to generate something new and creatively different; valuable insights. McKain (2022) argues that there are three ways to grow wisdom:

1. Read from diverse sources
2. Be curious
3. Experience.

On the question of whether we can define distinctive 'human' reason and thinking, it was clarified that there exists a distinctively 'human' way of thinking that differentiates Homo sapiens from the 'thinking' processes utilised by AI. Korteling JE, van de Boer-Visschedijk GC, Blankendaal RAM, Boonekamp RC and Eikelboom AR (2021). The human mind is biological, adaptive, and intuitive, whereas AI is digital, algorithmic, and token-structured. Although AI is different in kind from human thinking, it cannot be disputed that AI is extremely powerful, fast, and able to perform effectively at all six levels of Bloom's (1956) hierarchical thinking taxonomy – memory, understanding, application, analysis, evaluation, and creativity. In this regard, AI is inherently 'inhuman' but its output is highly plausible, and powerful, though still prone to error, bias, and disinformation.

In the light of this distinction in kind between human and machine, Learning Circle discussion focused on whether, and to what degree, educationalist should ask students to focus on meta-learning; justification as to how and why they (students) have produced their academic work to detect a potential AI 'impostor'. It was concluded that forms of AI can already very effectively fake expertise and therefore text-based meta-learning approaches were regarded as being ultimately futile (Heikkilä 2023).

Exposure to high level, complex texts and referencing of work to respected academic sources remain fundamental in the academic context. In the expanding AI environment vivas may also become increasingly important in high stakes assessment, as mentioned above.

Risk of algorithmic bias and fostering educational inequality

In relation to AI and educational inequality, it was noted that many Warwick students as yet have little knowledge or exposure to the development of AI. This may be due to factors such as lack of previous learning in this area or educational disadvantage. Conversely, other students have run ahead with the AI tools and are utilising them freely in their studies. Worryingly, student tutorial knowledge often originates from unreliable social media sources. Both extremes of student experience require tailored and differentiated training programmes.

The issue of algorithmic bias was also highlighted as a serious problem and something that might actively promote 'dis-inclusivity' within AI technology if unchecked and unregulated.

The AI deficit-excess problem is fast becoming more acute for both university students and staff. The urgent need for Warwick to engage in 'big conversations' around this topic and to produce a rapid response plan to manage the vacuum cannot be over-stated. A comment from a student that 'university is so 2015' made the point well. Procrastination will make it more difficult for the university to establish policy and practice and for ground to be recovered. The university needs to be proactive in relation to AI and in doing so, could potentially become a national and international academic leader in AI.

The university also needs to review the way it communicates with students about topics such as AI. It was observed that students no longer look at web pages and course handbooks. The development of a 'Learning-set' chatbot, giving instant live responses to student academic questions was suggested as a potential positive use of AI by the university.

ChatGPT's suggestion of how students might use ChatGPT effectively

Below is an example of what ChatGPT says about how a student might utilise it (ChatGPT) as a resource for answering a question

As a student there are several ways you can use ChatGPT to help you think critically about a problem. Here are a few suggestions:

1. Ask open-ended questions: Rather than asking ChatGPT for a straightforward answer to a problem, try asking open-ended questions that encourage critical thinking. For example, instead of asking 'What is the answer to this problem?', try asking 'What are some different approaches I could take to solve this problem?'
2. Seek clarification: If ChatGPT provides an answer that you don't fully understand, ask for clarification. This can help you identify any assumptions or gaps in your knowledge that you need to address

- before you can fully understand the problem.
3. Explore different perspectives: ChatGPT has access to a vast amount of information and can provide a range of different perspectives on a problem. Take advantage of this by asking ChatGPT to provide multiple viewpoints on the problem.
 4. Challenge assumptions: When ChatGPT provides an answer, ask yourself what assumptions are being made. Are there any other assumptions that could be made? Are there any counter-arguments to the assumptions being made?
 5. Evaluate evidence: If ChatGPT provides evidence to support a particular argument or solution, evaluate that evidence critically. Is it reliable? Are there other sources of evidence that contradict it?
- Overall, using ChatGPT as a tool for critical thinking requires an active and engaged approach. By asking open-ended questions, seeking clarification, exploring different perspectives, challenging assumptions, and evaluating evidence, you can use ChatGPT to help you think more critically about a problem.

Assessing students' fluency in English throughout their studies

Within this strand we also discussed the challenge that AI presents concerning English language competence - a [2021 Office for Students report](#) stipulates that competence in English should be within the scope of our academic judgement in the assessment process. AI disrupts this because students may use AI to ensure their written submissions are in flawless English, and consequently not an accurate reflection of their ability to write clear and grammatically correct English. Considering that students are awarded a UK degree at the end of their studies, for many participants of the group it was seen as essential that the sector continues to assess throughout their studies students' own written and spoken English.

Concluding Advice for Educational Leaders and Educators

In the fast moving and currently unregulated AI environment, there is a need for Clarity, Urgency, and Capacity & Capability.

- ▶ Clarity of policy and practice in relation to the use of AI across the university.
- ▶ Significant resource investment by the university to respond to the various opportunities and threats presented by AI so that the university has the capacity and resilience to adapt to and to influence the changing AI landscape of the future.
- ▶ A commitment to training its community (staff and students) in the use of AI and developing programmes to help prepare Warwick students to use AI responsibly beyond the university.
- ▶ An urgency in achieving the above so that the university becomes a positive AI change agent in the UK and the international academic context, rather than a passive or reactive observer.

Chapter 2.2: AI for Teaching and Learning including tools for educators

Findings based on group meetings led by Neha Gupta



DALL-E 2, 2023f

Summary

The discussions of this strand centred around the potential use of AI and some of the readily available AI tools that can be employed by educators and students alike using AI as a collaborative partner. The group explored the opportunities where the AI tools can be particularly used by mapping an educator journey and a student learning journey to identify the key touchpoints where the AI tools can serve as a co-pilot for both the actors (students and educators).

Introduction

The strand highlighted that major technological firms (e.g., Microsoft, Google, Open AI) primarily lead the development of transformative AI tools. These tools are expected to be widely adopted in Higher Education given its remarkable capabilities to enhance productivity, create learning opportunities, and facilitate access to timely information. At the same time, it is crucial to acknowledge the limitations of AI tools, as its predictive abilities depend on the underlying training data these tools are trained on as well as lacking the ability to provide critical reasoning. Interaction with tools such as ChatGPT may create an illusion that these AI tools possess all understanding about a topic, though the accuracy of the information provided by these tools can vary depending on the specific question. Therefore, as educators it is critical to clearly distinguish between the Dos and Don'ts of the use of AI tools and share best practices with the staff and student community across the university. The strand particularly looked at the areas where the output from these AI tools could be valuable to collaborate with on a teaching and learning journey.

AI assisting educators and student journey

There are many AI tools available today and, at the time of writing this report, more of such AI tools are being developed. To capture the potential use of AI tools from both educators and student viewpoints, educator and student journey maps were created. In chapter 1.2 we have shown:

- ▶ A Student view of an educator's teaching journey,
- ▶ A Student view of a student's learning journey.

In this chapter we show the Educator's view of an educator's teaching journey (see Figure 2.2.1).

As evident (and also highlighted) there are some key areas where AI tools can be readily employed for enhanced teaching and learning experience.

Educator Journey Map (Educator View)	Educators	Preparation	Classroom Management	Feedback	Professional Development
	What is the Educator's action?	<ul style="list-style-type: none"> Lesson Planning Researching, designing, adapting, teaching material Designing engaging and interactive teaching activities 	<ul style="list-style-type: none"> Establishing clear expectations and rules Managing student behavior Engagement Linking 	<ul style="list-style-type: none"> In class answer to question Written feedback 	<ul style="list-style-type: none"> Continuing education pursuing advance courses Accreditation/certification Publication Peer dialogue and collaboration
	What is the Educator's technology?	<ul style="list-style-type: none"> Google Scholar Research suites Books/Class Podcasts 	<ul style="list-style-type: none"> Lecture Slides Teaching aids Online lecture delivery technology or F2P Lecture Create 	<ul style="list-style-type: none"> MYWBC, School MIS system 	<ul style="list-style-type: none"> Conference Workshop/Training Internal and External Meetings
	AI collaboration in some activities examples discussed by strand 22	<ul style="list-style-type: none"> Generate framework of lesson plan Generate indication list of sections to be covered for a topic Automated final draft generation Link and cited list generation 	<ul style="list-style-type: none"> Group work management Digital tools 	<ul style="list-style-type: none"> Automated draft feedback generation Rephrasing of feedback 	<ul style="list-style-type: none"> Productivity management Email, Calendar updates of conferences, meeting notes Automated notification of key income specific Information published PDF summarization

Figure 2.2.1 Educators View of Educators Teaching Journey

The main focal areas where the AI tools were considered to be very useful were in lecture preparation, classroom management, providing feedback to students and also in CPD (continuous professional development) activities of an educators (Figure 2.2.2). The Strand 4 Learning Circle group discussed some examples areas of each of these four actions (Preparation/Classroom Management/Providing Feedback and CPD) in greater detail.

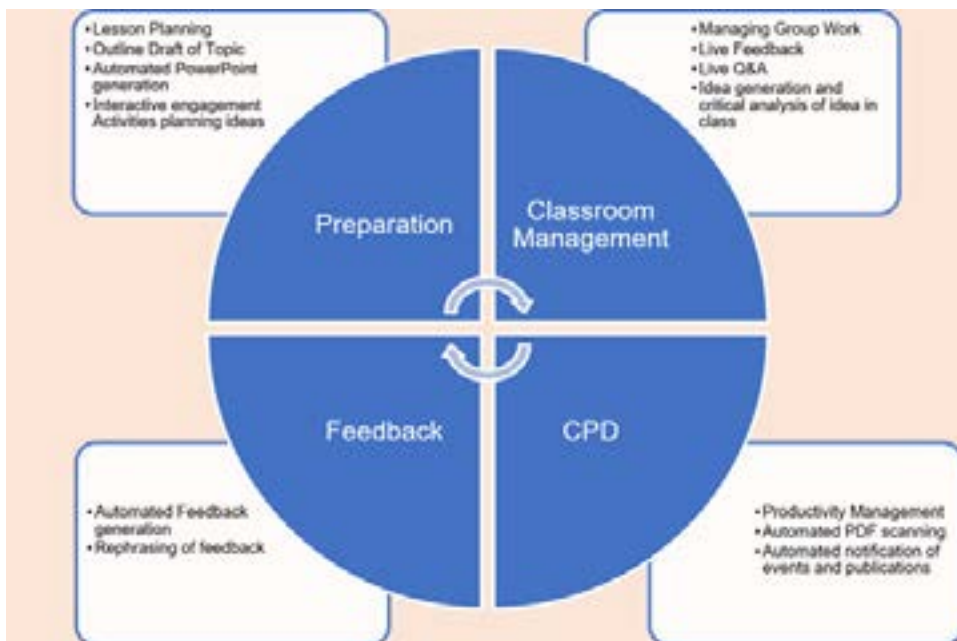


Figure 2.2.2. Key Touchpoints of AI collaboration in Educators Journey

Example Use Cases for Educators and Students - Preparation

AI tools such as ChatGPT works on prompts. Once the user provides a prompt (sometimes also referred to as prompt engineering) the tool will return or output a series of possible answers. A lecturer can prompt the tool to craft a *lesson plan*, create a *framework of a lecture* on a particular topic, or *generate an outline of a PowerPoint* on a topic. *Images and text can also be generated* using AI tools. A student or lecturer can use an AI tool to generate *summary or key points* discussed in a piece of document or text. Often

students and educators struggle with generating initial ideas about the topic. In this space AI tools can be a collaborative partner to brainstorm ideas and provide an *initial list of ideas or motivational break* deviating from the original thought process. The strand also discussed the use of lecture preparation activities required for international students. AI tools can be used as a *language learning* tool.

Example application scenarios and prompts for ChatGPT:

1. **Improve your writing:** *Proof read my writing above. Fix grammar and Spelling mistakes. Make suggestions that will improve my writing clarity.*
2. **Use 80/20 rule to learn a topic:** *I want to learn about [insert topic]. Identify and share the most important 20% of learnings from this topic that will help me understand 80% of it.*
3. **Generate New Ideas:** *I want to [insert task or goal]. Generate [insert desired outcome] for [insert task or goal].*

Example Use Case - Classroom Management and Student expectation of AI tools

AI tools can be deployed for more engaged and effective *group work*. Going forward, AI algorithms can analyse student profiles, skills, and learning styles to create balanced and effective groups. By considering factors such as individual strengths and weaknesses, personality traits, and previous collaboration experiences, AI can help form groups that are more likely to work well together. AI-powered platforms can track the progress of each group in real-time. The AI tool *creates a summary of the group discussion* and then the teacher can critically discuss each group's summary in the class, and showcase to the students what is missed by the AI tool - thereby also explaining to students about the limitations of AI tools. There might be examples where interesting thoughts which are generated by a student group become eliminated in an overall summary and this could lead to an interesting debate in the class. The teacher can also show a summarisation of a research paper by an AI tool and then discuss with students how the AI tool may have missed out on the critical evaluation aspect, pointing out the detrimental impact this will have on the overall marking grade.

Example Use Case - CPD

AI, or other digital tools, can help educators automate repeated tasks such as writing meeting minutes from the transcript of a recorded meeting. Some AI tools can automatically suggest meeting times based on participants' availability, analyse event titles and descriptions to provide relevant information and resources, and offer smart notifications and reminders. Educators can use AI tools to narrate an optional path for their career journey and potential courses and certifications they can explore about a topic.

Concluding Advice for educators

In summary, embracing AI tools as a collaborative partner in the areas mentioned in Figure 2.2.2, educators can unlock new possibilities for enhancing teaching and learning experiences. It is important to approach AI tools as powerful aids that *augment* human expertise, not replace it. As you integrate AI tools into your practice, remember to maintain a balance, continually evaluate their effectiveness, and adapt them to suit your specific teaching context and student needs. Embrace the potential of AI to innovate your educational practices and create meaningful and impactful learning experiences for your students.

Useful Links

ChatGPT 5 lessons in 5 minutes:

<https://www.slideshare.net/DominikLuke/chatgpt-5-lessons-in-5-minutes>

How Chat GPT can reduce teacher workload - mainly designed for school children but can have some common themes applicable to HE

<https://drive.google.com/file/d/1q9exc7gm3DpRAygeV8hgZ-7sVnyrTq6b/view>

Lindy is an AI assistant that can help with all your tasks, from calendar management and email drafting to contract sending and beyond.

<https://www.lindy.ai/>

Google Bard: creative and helpful collaborator, here to supercharge your imagination, boost your productivity, and bring your ideas to life.

<https://bard.google.com/>

AI course creator

<https://www.lingio.com/en/global/>

Customised mail creator: *Superhuman AI* matches the voice and tone in the emails you've already sent, applying that to everything it creates.

<https://superhuman.com/>

AI art generator

<https://www.adobe.com/sensei/generative-ai/firefly.html>

Learning resources about AI

<https://www.cloudskillsboost.google/journeys/118>

How to Teach and Learn with ChatGPT

<https://www.slideshare.net/bohemicus/how-to-teach-and-learn-with-chatgpt-bett-2023>

<https://edutools.fyi/edutools/Edu-Tools-6d4ae0b3c64743cca7370b18b037e373>

Calendar AI apps

<https://leader.net/calendar/>

<https://claralabs.com/>

AI in Classroom - Book

https://www.amazon.co.uk/Classroom-Artificial-Intelligence-Revolution-Hitchhikers-ebook/dp/B0BVG8V8GST/ref=sr_1_2?crid=34U6DNFSA43S2&keywords=the+ai+educator&qid=1679682822&prefix=the+ai+educator%2Caps%2C77&sr=8-2

Final hint: To stay on top of trends I follow on LinkedIn:



Chapter 2.3: Academic Integrity and AI Ethics

Findings based on group meetings led by Sam Grierson and Lee Griffin (ex officio Academic Integrity)



DALL-E 2, 2023d

Summary

This subgroup focussed on institutional philosophy and guidance for staff and students concerning the application of artificial intelligence (AI) in academic integrity.

Members of this subgroup emphasised the importance of protecting academic integrity and delivering a clear message to students regarding maintaining academic integrity in assessments. They recognised the need to establish transparent guidelines for students' use of AI, acknowledging its potential to support various aspects of the learning process. These discussions resulted in the following outcomes:

- ▶ Building trust between educators and learners.
- ▶ Acknowledging that AI tools are valid for studying and work.
- ▶ Providing guidance and support in utilising AI technologies to foster collaboration between educators and learners.

The strand's work concluded that universities should prepare students to use AI confidently and responsibly in professional settings. Academic institutions must revisit and update their policies and procedures to promote moral and ethical responsibility. Users should commit to upholding academic integrity, openly acknowledging the work of others, and taking pride in their own academic achievements. By meeting these standards, individuals and the academic community can contribute to an expert conversation within a culture of academic integrity.

Key Findings

We must develop a model which embeds cultural elements, helping to remove the motivation to engage in academic misconduct through support and dialogue. Detection is only part of a wider model for academic integrity, working alongside a positive and supportive culture as well as good assessment design and clear delivery.

There is an overall model for academic integrity as follows, being a supportive and positive culture surrounding clear and robust processes around design, delivery and detection:

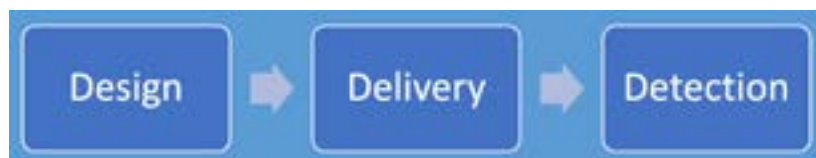


Figure 2.3.1: A supportive culture

AI Detection

Academic integrity is valued among staff and students: there is an expectation of honesty in the use of information, in formulating arguments, and in other activities related to the pursuit of knowledge and understanding.

Guidance on Regulation 11

We need to be aware of the longevity of detection tools, as new Generative AI Tools (GATs) and software advances, detection tools can quickly become obsolete.

The organisational culture helps shape the overall response and expectations of staff and students.

This overall concept allows for a framework within which undefined or novel situations can be explored effectively.

The key two policies that affect the area are:

- ▶ Regulation 11 and its attendant guidance (Reg. 11 Academic Integrity (from 4 Oct 2021) (warwick.ac.uk)); and
- ▶ The Proofreading Policy (Proofreading Policy - Education Policy and Quality Team (warwick.ac.uk))

Aligned to this is the Student Declaration and general data processing on submissions (Turnitin etc)

What is 'acceptable'?

Regarding Artificial Intelligence it is not possible to give a definitive definition of 'acceptable'; this will need to be considered at department, module and component level.

Basic forms of AI are often accepted, such as spell checkers, grammar checkers and so on. Quite where the border between 'acceptable' and 'not acceptable' lies would be at the component level; it is entirely possible that part of a module assessment will use an AI but another component would exclude it.

The key is *clarity for staff and students* at every level.

Sector response

The Russell Group agreed [principles on the use of generative AI tools in education](#) with five principles:

1. "Universities will support students and staff to become AI-literate;
2. Staff should be equipped to support students to use generative AI tools effectively and appropriately in their learning experience.
3. Universities will adapt teaching and assessment to incorporate the ethical use of generative AI and support equal access.
4. Universities will ensure academic rigour and integrity is upheld.
5. Universities will work collaboratively to share best practice as the technology and its application in education evolves."

Warwick's response is aligned with those principles, building from a supportive culture that recognises AI is a tool that both staff and students should become comfortable using, and know how and when to use it responsibly, ethically and appropriately.

What drives Academic Misconduct?

Introduction

It is easy to focus on prevention of unwanted behaviour by 'policing' and the blocking/detection of issues. While this is part of any comprehensive programme it is not the entire answer. As an institution we should consider deeper cultural reasons why anyone would choose to 'cheat'.

A model

People tend to perform nefarious or ethically dubious acts in specific circumstances, not because humans are fundamentally unethical or dishonest.

A model for this was proposed by Cressey following interviews with convicted fraudsters in 1973 and, while simplistic and some fifty years old, remains instructive. His model is that for a person to commit a fraud three circumstances must align, much as a fire requires heat, fuel and oxygen.

The three factors identified were:

- ▶ An opportunity to undertake the act;
- ▶ A motivation to undertake the act; and
- ▶ An ability to rationalise the act as being acceptable.

For most people all three need to be present before the act will be undertaken.

Opportunity

Opportunity is the usual focus. In the assessment space, to remove opportunity the initial response would involve the use of highly controlled environments, such as in person invigilated exams or restrictions on access to unwanted support or resources.

While invigilated exams and similar have a place in assessment, they are not a silver bullet. Those who are driven to cheat will find their own opportunities.

Restriction of opportunities is important, but the pedagogic value of non-exam assessments that are *diverse* and *authentic* would be lost if exams became the sole means of assessment. Developing innovative assessments that appreciate developing techniques and technologies is desirable. For example, in person exams involving calculations moved from no aids to slide rules to pocket calculators to programmable pocket calculators. Part of that drive was doubtless to reflect working practices students would face, allowing them to develop relevant employability skills.

New technologies should be worked *with* not *against*.

Overt and excessive focus on restriction of opportunities misses the wider factors.

Reducing Opportunity

To help prevent cheating, part of the solution will be around assessment design, part around the mode of delivery, and part around detection *post-hoc*.

Motivation

While no full study has been done specifically looking at motivations around academic misconduct the following are commonly identified:

- ▶ **Lack of time**, which can include academic work overload, the need to earn while studying, excessive extracurricular activities, or poor time management;
- ▶ **A specific grade requirement** or **fear of failure** adversely affecting job offers, pride, familial or peer expectations etc;
- ▶ **Relationships** such as 'helping' a friend-in-need leading to collusion, or encouragement (accidental or otherwise) for the other party to cheat;
- ▶ **Embarrassment** to speak to tutors about a lack of comprehension, or to seek help for medical (especially mental health) issues;

Naturally there will be **counter-motivations** too, such as the desire to master the skill/knowledge under scrutiny rather than merely passing a point assessment.

Reducing Motivations

Motivations must be reduced via suitable support and coaching. This would include:

- ▶ Levering the personal tutor network to encourage students to come forward for help in times of stress;
- ▶ Contact with students to help/encouraging students to contact tutors for help with questions, such as

- ▶ making a safe non-judgemental environment where concerns can be discussed individually or in groups;
- ▶ Making students aware of support such as Wellbeing services;
- ▶ Identification of 'at risk' students/modules/cohorts who may have a disproportionate concern about an assessment with a view to coaching before the motivation builds;
- ▶ Encouragement to engage with any time-management support available

A supportive environment *should* ameliorate the risk from motivation.

Rationale

This final aspect is the ability for a person to say '*this is fine*' to themselves; that what they are about to do is acceptable and therefore not ethically or morally questionable. While it is not necessarily a considered process (there may be no executive cognition involved at all depending upon one's own ethical/moral perception) of self-justification most of us won't cross an ethical/moral/legal boundary without good reason. It's easier to mentally *move* the boundary (or interpretation of it) or *rationalise it away* as either not applying in a given situation, or being a bad 'law', or something that can be ignored for whatever reason.

Again, no specific studies on rationalisation have been done, but work includes the following reasons:

- ▶ **Herding behaviour** which can be summarised as 'everyone else is doing this, so it must be fine for me to do it' or 'I will lose out if I don't do this.';
- ▶ **Utility of risk versus reward** such as 'If I get caught is the downside worth the upside of not being caught?';
- ▶ **Disagreement** with protocol/norms/law because it is 'petty' or 'unfit for purpose' or 'I did not agree to this'

So what?

The initial reaction to a new threat is to focus on *opportunities to cheat* which while valid is a narrow approach, the whole culture around ethics and morality forms a tripartite approach to any threat. Warwick staff, students and alumni are seen as honest brokers. That is integral to who we are; that culture permeates all those who work and/or study here.

In short - ***we don't cheat.***

Reducing Rationalising Academic Misconduct

Rationale is addressed by institutional culture, which can be reinforced by such actions as:

- ▶ Making expectations clear via assessment instructions, the student handbook etc;
- ▶ Having a clear declaration that explains expectations and consequences of academic misconduct;
- ▶ Positive reinforcement of academic norms, such as the celebration of Academic Integrity (currently planned for Term 1 Week 8);
- ▶ Courses for students to complete, such as those at the Library concerning avoiding plagiarism and referencing

This continued demonstration should ameliorate the risk from rationale.

General Guidance for staff

Below is the output of the WIHEA learning circle completed July 2023, linked to other sections of this document with greater detail.

Introduction

While AI can bring many opportunities there is sector-wide anxiety concerning Ethics and Academic Integrity, including concerns about the lack of sector and institutional solutions and guidance.

There is a clear paradigm shift in this area of teaching, learning and assessment which follows from a turbulent period of unexpected and unavoidable change resulting in incredibly hard work within departments to adopt to new norms, both technologically and psychologically. The recent pandemic forced change in teaching, learning and assessments and AI induces fear that yet more change is required. Some of that fear comes from not having the time to develop the skills required to feel adept

at using and integrating GAITs into work, whatever the level, assessment, module, programme, or department. Colleagues want to know:

- ▶ how to detect academic misconduct where such tools are being used;
- ▶ more about AI Ethics and guidance on how to incorporate this into the learning process;
- ▶ and how to use GAITs effectively in their own professional practice

It is not however all negative and there is much being discussed on the potential AI and GAITs could have for both educators and learners.

"...reforms in education are needed to ensure that all learners can benefit optimally from the use of AI in education. AI has the potential to combat many of the deep-rooted problems ... from a narrow and shallow curriculum, to entrenched social immobility. AI could allow societies to move away from an outdated assessment system"

(The Ethical Framework for AI in Education: 2020)

Learning Circle Colleagues regarded the possible advantages of AI as:

- ▶ creating an opportunity to revisit the purpose of education and how it should prepare students for the future changing world
- ▶ creating an opportunity for the university to redesign its assessment methods
- ▶ a tool that could be adapted to support teaching, learning and assessment
- ▶ an adaptive learning tool that can support independent learning, student equity and closing attainment gaps for key learner groups

What are Generative Artificial Intelligence Tools (GAITs)?

A type of artificial intelligence tool trained to generate a human-like response from pre-existing large data sets, these include data from websites and journals, textbooks. GAITs, like ChatGPT create content which is different to some of the AI tools like Grammarly which check your writing, correct spelling and grammar and help in avoiding plagiarism. GAITs are transactional, they use secondary sources to supply information; they generate information based on data in their database. They are programmed to provide a response based on an initial prompt. There are various GAIT models, but the chatbot models of contemporary note at the time of writing include ChatGPT, DALL-E, Bing AI, and Google Bard. They do not engage with information the way humans do, and they do not operate according to moral or ethical principles. Read more on responsible and ethical engagement with AI here (ADC 2023)

What Generative Artificial Intelligence Tools are not

- ▶ GAITs do not demonstrate working memory or higher order or executive thinking;
- ▶ They are not providers of new, original, or creative information. They may provide accurate, inaccurate, or even inappropriate material but it is a reconfiguration, on prompt, of information that already exists.
- ▶ GAITs respond to your request to generate an outcome which is not necessarily correct despite sounding authoritative.

Human intelligence and wisdom vs artificial intelligence

AI is great on the intelligence side, thinking logically, conceptualising and linking the ideas it has in its database, but human beings have the additional advantage of wisdom: wisdom to connect new ideas creatively, or to use past experience to give new insights on existing concepts.

Put simply, AI can convey information, think logically, and conceptualise and structure ideas but it takes human wisdom to use that information to demonstrate insight and understanding and to generate something new and creatively different.

Critical engagement with students on GAITs

It is important to be clear with students about how GAITs can and should not be used in their learning and assessments. It is equally important to encourage students' critically on the development and

maintenance of these tools.

Both educators and learners need to become informed about the ethical debates in this area. Remember that GAITs:

- ▶ are proprietary;
- ▶ are not free from political and economic influence;
- ▶ present the voice of a limited few;
- ▶ consume energy and have a big carbon footprint which impacts on the environment; and
- ▶ are often fed by the toil of others without acknowledgement.

Ethical use and detection

Key is a clear understanding of expectations at an institutional, faculty, department and assessment level. That is dealt with via three layers of guidance. These can override each other from a granular level upwards.

The component level will always be definitive, however where a component is silent then departmental guidance would be definitive, if departmental guidance is silent then faculty guidance is definitive, if that is silent then the institutional guidance is definitive.

The institutional position is that the use of AI is permitted in a responsible manner, however where it has been used the reason for its use must be stated, its output made clear in the submission, and the student must be able to demonstrate intellectual ownership of the work.

Where faculties, departments or assessment designers do not wish this to be the case the specific requirements must be made clear to the student. This is done via three levels:

- ▶ The Institutional guidance to students and staff;
- ▶ Faculty/Department guidance given to students via the student handbook and staff via usual briefings; and
- ▶ The assessment brief and instructions.

To summarise, each lower level can overrule the higher level. If a department's default prohibits AI use but an assessment component allows it, the assessment component is definitive. Department guidance wording should be that the component sets out AI expectations, but in the event the component does not students should follow the department default.

This is encapsulated in the student declaration, meaning the student must acknowledge they understand the position prior to submission and have no reasonable excuse for misuse.

Potential Action in Departments:

Promote academic integrity by:

- ▶ **Recognising the responsibility of all**, staff and students, to ensure that work is appropriately accredited. The output from GAITs cannot be given academic credit as they are not the student's work, therefore their use needs to be acknowledged in the same manner another human's work would be. GAITs are currently not recognised as authors in their own right, so disclosure and explanation of their use, for example through the use of appendices, should evidence how GAITs have been utilised.
- ▶ **Identify networks of support.** Academic integrity officers should develop internal and external networks of support to be able to advise academic staff and to work with consistency to identify potential cases of academic misconduct.
- ▶ **Add the submission of an academic integrity declaration statement to all assessment submissions.** Discuss these with students when you set your assessment, doing this at the formative stage is advised.
- ▶ **Engage** with EPQ and SLEEC advice and guidance on policy changes.

- ▶ **Review Internal policies and practices** to determine if they align with University of Warwick guidance and departmental practices. Do they suitably address the use of AI tools. **Update appropriately** adding in caveats that defer to each module guidance and assessment instructions.
- ▶ **Review assessment design.** Engage with students and staff on the benefits of authentic, inclusive, and innovative forms of assessment. Plan for an assessment that aims to design in or to design out GAITs. The WIHEA Diverse Assessment Learning Circle has developed some assessment principles now published and hosted on ADC - Principles of Assessment Design and this guidance has now been extended to incorporate principles of good assessment design that support the use of artificial intelligence.

Student Guidance on the Use of AI in Education and Assessments

Below is the guidance developed by a WIHEA learning circle co-created between staff and students.

Introduction

The goal of your journey as a Warwick student may be employment, further study, or both. Your degree award is one of the achievements along the way. Summative assessments are a means to achieving that award, but they are largely developing your skills and abilities against a range of relevant criteria required for work, further research, and successful navigation through life.

GAITs can be valuable in motivating students, reducing procrastination, stimulating thoughts e.g., on how to structure a paper. For students this can allow you to more quickly focus and to engage in developing the skills required for successfully traversing higher education e.g., critical thinking, communication, presentation, and analysis. They are tools, which when used responsibly, support you with your independent studies.

Remember:

- ▶ Where chatbots are used it is good practice to retain a copy of the questions asked and the content Generative and record a brief explanation of how it was used.
- ▶ The permitted use of GAITs for assessments varies. Please read your department handbook, module, and assessment guidance before using GAITs for your summative assessments.

What are Generative Artificial Intelligence Tools (GAITs)?

A type of artificial intelligence tool trained to generate a human-like response from pre-existing large data sets, these include data from websites and journals, textbooks. GAITs, like ChatGPT create content which is different to some of the AI tools like Grammarly which check your writing, correct spelling and grammar and help in avoiding plagiarism. GAITs are transactional, they use secondary sources to supply information; they generate information based on data in their database. They are programmed to provide a response based on an initial prompt. There are various GAIT models, but the chatbot models of contemporary note at the time of writing include ChatGPT, DALL-E, Bing AI, and Google Bard. They do not engage with information the way humans do, and they do not operate according to moral or ethical principles. Read more on responsible and ethical engagement with AI here (https://warwick.ac.uk/fac/cross_fac/academic-development/ai/more)

What Generative Artificial Intelligence Tools are not

- ▶ It does not demonstrate working memory or higher order or executive thinking;
- ▶ They are not providers of new, original, or creative information; they may provide accurate, inaccurate, or even inappropriate material but it is information that already exists.
- ▶ It responds to your request to generate an outcome and requires fact checking.

Human intelligence and wisdom vs artificial intelligence

AI is great on the intelligence side, thinking logically, conceptualising and linking the ideas it has in its database, but human beings have the additional advantage of wisdom: wisdom to connect new ideas creatively, or to use past experience to give new insights on existing concepts.

Put simply, AI can convey information, think logically, and conceptualise and structure ideas but it takes human wisdom to use that information to demonstrate insight and understanding and to generate something new and creatively different.

Guidance for students

What can you use GAITs for?

To assist you in demonstrating your own criticality and drawing comparisons. Providing information that will help you to engage with the literature and sources.

It can assist with:

- ▶ Lateral thinking;
- ▶ Alternative thought streams;
- ▶ Supplementary and complementary thinking;
- ▶ Data, charts, and images;
- ▶ Getting starter explanations; a note of caution that you must fact check this information;
- ▶ Keep interrogating AI on the questions to create own novel insights;
- ▶ For formative learning; and
- ▶ For fun

To enhance your learning:

- ▶ A revision tool to generate practice questions
- ▶ Structuring plans and line of reasoning
- ▶ Refining your work
- ▶ Supporting language skills

Where you have been granted permission to use generative artificial intelligence sources this should be clearly acknowledged. There is no currently agreed referencing standard, so your department will tell you its preferred approach. For example:

[GAIT Name] has assisted in structuring this assessment. This was used to help me organise my thoughts, the underlying work remains my own.

[GAIT Name] was used to generate alternative streams of thought. It was used to generate ideas to help me start my assessment. I have attributed the ideas it generated and my further development of them remains my own.

[GAIT NAME] has been used to generate ideas and source articles. I used this because I was instructed to as part of this assessment. I have attributed the ideas it generated and my further development of them remains my own. I have read all source articles cited in this work.

[GAIT NAME] has been used to proofread, edit, and refine spelling and grammar in the following sections. This was used because I am not confident in the use of English tenses.

What should you not use GAITs for?

- ▶ Replacing learning. Value your stream of consciousness and being sentient.
- ▶ Gaining an unfair advantage. This is academic misconduct.
- ▶ Creating content for your work which you present as your own work. This is plagiarism.
- ▶ Synthesising information. You will not be able to demonstrate your work and thinking as opposed to that artificially generated.
- ▶ Rewriting your work or translation. It is important that you develop your own distinctive academic voice. Markers would much rather read imperfect English that is your voice than perfect English written by another human or AI. See also the Proofreading policy (Proofreading Policy - Education Policy and Quality Team (warwick.ac.uk)).

Examples of GAIT misuse include, but are not limited to, the following:

- ▶ Copying or paraphrasing sections of AI-Generative content so that the work is not yours, but you present it as yours;
- ▶ Copying or paraphrasing whole responses of AI-Generative content without correct attribution and explanation;
- ▶ Using an AI to complete parts of the assessment so that the work does not reflect your own work, analysis, evaluation, or calculations;
- ▶ Failing to acknowledge use of AI tools when they have been used as a source of information;
- ▶ Incomplete or poor acknowledgement of AI tools; or
- ▶ Submitting work with intentionally incomplete or misleading references or bibliographies.

You should also ensure you have read and understood Warwick's Academic Integrity Framework ([Academic Integrity Framework \(warwick.ac.uk\)](https://warwick.ac.uk/academic-integrity-framework)).

Responsible and Ethical Engagement

It is important to remain informed about the strengths and benefits of these technologies. It is equally important for you to note the guidance on academic conduct provided by your department and the University of Warwick on working with Academic Integrity.

Remember that GAITs:

- ▶ are proprietary;
- ▶ are not free from political and economic influence;
- ▶ present the voice of a limited few;
- ▶ may process your data in unknown ways;
- ▶ consume energy and have a big carbon footprint which impacts on the environment; and
- ▶ are often fed by the toil of others without acknowledgement.

Why produce student guidance?

To ensure University of Warwick students keep pace with others nationally and internationally whilst still encouraging the creation of original content. Students need to know how to:

- ▶ use GAITs responsibly;
- ▶ engage with the material generated by GAITs; and
- ▶ go to original sources and ensure information used can be appropriately acknowledged.

This guidance also aims to ensure equity in student experience, removing further barriers to success, which can be disproportionately experienced by some groups.

If all students know how to access and use a wide range of GAITs e.g., proofreading software, article, and reference generators, they can then choose the extent to which these tools can assist them in the production of assessments in an ethically appropriate way. Particularly students with challenges such as organisation, procrastination, knowledge processing etc. could additionally experience a compounding impact of disadvantage. With knowledge comes the power to choose.

Remember, we are part of an academic community at Warwick. Whether studying, teaching, or researching, we are all taking part in an expert conversation which must meet standards of academic integrity. When we all meet these standards, we can be proud of our own intellectual ownership, as well as academic achievements as individuals and as an academic community.

Academic integrity means committing to honesty in academic work, giving credit where we have used others' ideas and being proud of our own achievements.

General Guidance

Introduction

This section sets out the Institutional approach, and suggests how faculties and departments should approach the issue as required for their area.

Precedence

As noted elsewhere, the *assessment component* is the final statement on the appropriate or otherwise use of any AI or technology. If it is silent concerning the use of AI then any module guidance takes precedence. If that is silent then it is departmental guidance, if that is silent then any faculty guidance, and if that is silent the institutional position is adopted.

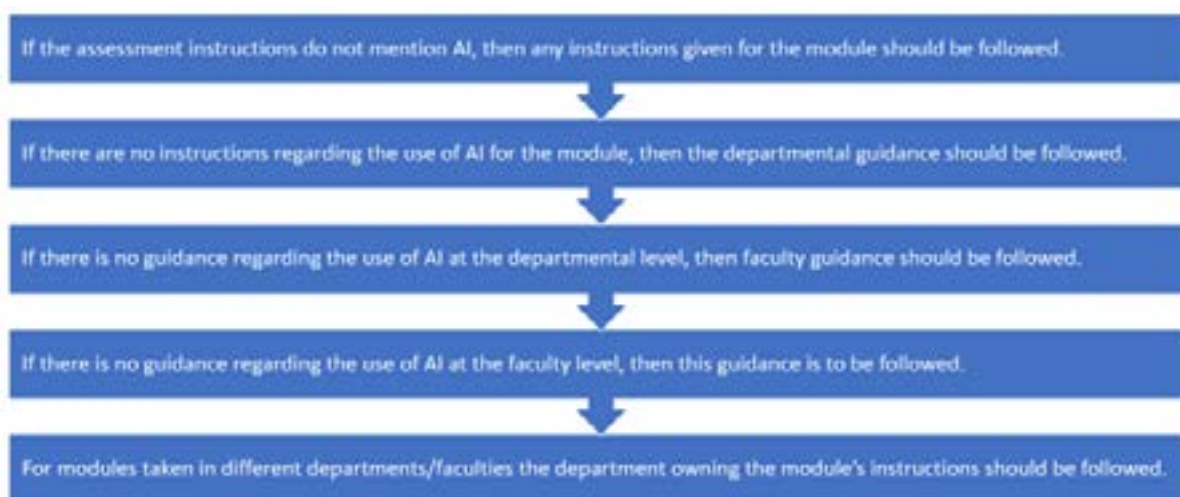
The Institutional position

The University of Warwick recognises Generative AI as a tool that should be embraced by staff and students. Support for both to utilise it ethically and appropriately is important.

Overall position

Students may use Artificial Intelligence while completing their assessments, subject to faculty, departmental, module and assessment component restrictions. That use is subject to appropriate acknowledgement of where, how and why it has been used.

Where there are restrictions on its use those restrictions should be made clear in the assessment instructions.



General requirements

Where a student has used AI the student must make it clear where and for what purpose AI has been used, and clearly distinguish where the AI's work is presented.

Academic credit cannot be gained by an AI on behalf of a student, credit must flow from the student's own work.

Students must be able to demonstrate intellectual ownership of all work submitted.

Where AI has been used students should, in an appropriate place, or attached to the work, state the following:

- ▶ Why an AI was used
- ▶ Which AI was used

- ▶ Where an AI's output is used
- ▶ Where an AI's output has been modified before use

Students are advised to keep good records of their interactions with any AI regarding all their submissions in case they are later required as part of any further assessment, investigation or similar.

General guidance to faculties and departments

Faculties and departments necessarily need to flex the general position to suit their particular needs. This must be made clear to students to avoid confusion.

The below are suggested actions for departments to take:

- ▶ Communicate the value of integrity;
- ▶ Publish academic integrity statements on module pages (the VLE may be the most suitable space);
- ▶ Set clear expectations around disclosure;
- ▶ Highlight updates - notify students of regular updates on policy developments;
- ▶ Signpost sources of support for students should they require additional information on maintaining academic conduct, e.g., academic integrity officer office hours;
- ▶ Encourage students to provide a screen recording of the content generated through LLM tools;
- ▶ Communication with students - engage early;
- ▶ Emphasise student learning - developing key skills such as critical thinking, evaluating evidence and academic writing practices;
- ▶ Ensure the student handbook and other sources are clear on the acceptable use of AI
- ▶ Encourage module owners to set out what is an acceptable use of AI in the module
- ▶ Encourage assessment designers to be specific and clear on the acceptable use of AI in each assessment component.

The Student Declaration

This is important to frame the use of Artificial Intelligence and make it explicitly clear to students what is and is not acceptable, the purpose of the declaration is to focus the mind on specific requirements. Central guidance cannot form a 'one size fits all' answer, it is likely that acceptable use policies will need to be considered at the component level under general central principles.

The student declaration fosters a relationship of trust between the learner and educator. It recognises that AI and GAITs are now legitimately used in society and in the workplace, are an area for study and investigation and that an important part of a university's role is to prepare students to use AI and GAITs confidently and responsibly in society and when they enter the workplace.

The University of Warwick student declaration is predicated on the belief that academic integrity means committing to honesty in academic work, giving credit where others' ideas have been used and being proud of our own achievements. Suggested examples can be found in the appendices.

Guidance on the appropriate wording for student declarations can be found in Appendix 3.

Chapter 2.4: Assessment Design

Findings based on group meetings led by Leda Mirbahai



DALL-E 2, 2023e

Summary

Assessments need to consider the learning journey and not just the final output. Authentic assessments allow educators to harness the power of technologies while maintaining assessment validity and integrity. The principles of assessment design, including those outlined in the QAA guide on assessments, also apply to the use of technologies, including artificial intelligence. Educators should be clear about when, where, and how artificial intelligence can be integrated into assessments. When appropriate, assessments should promote AI literacy, preparing students for the future in terms of tools, concepts and ethics. Technologies, including AI, should only be used if they enhance the pedagogical process and contribute to a comprehensive learning experience.

Role of AI in the assessment learning journey

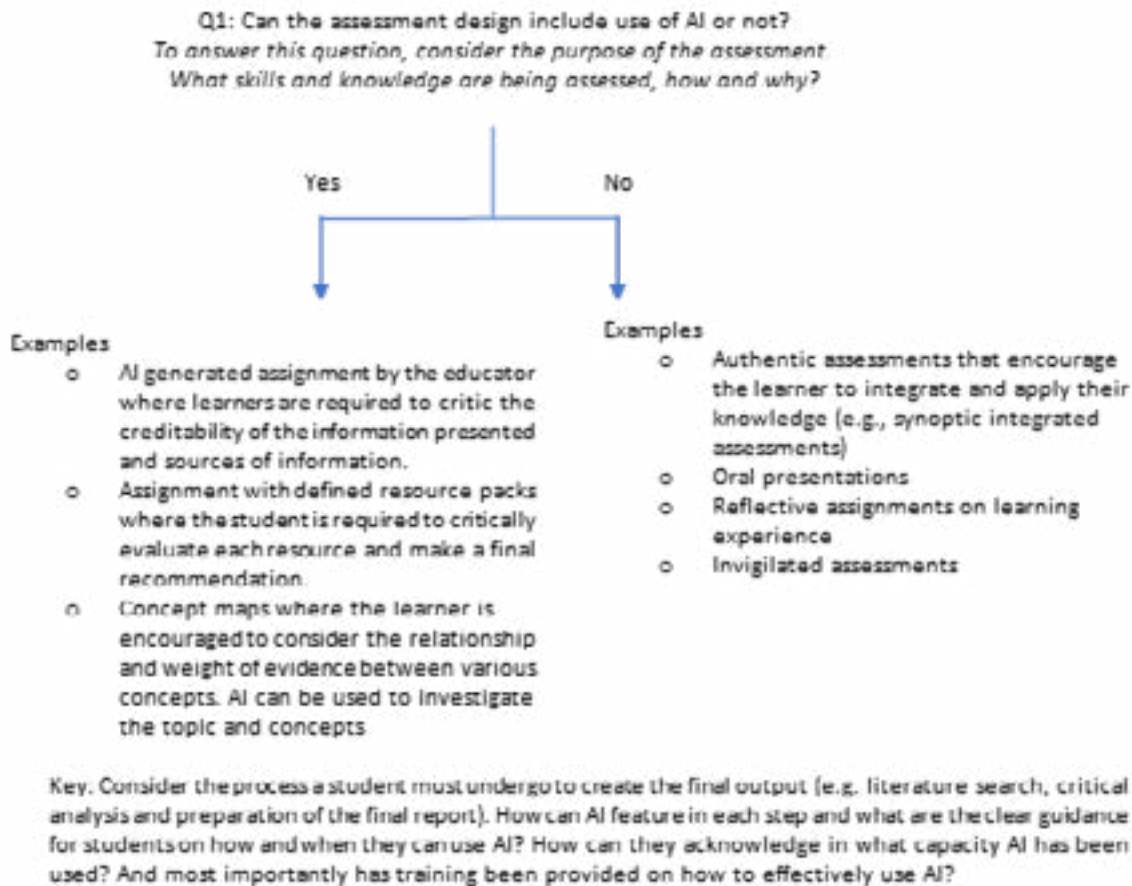
Technology and pedagogies are interlinked and should be considered jointly when designing and developing a holistic assessment strategy and approach. AI-driven assessments in particular can provide an accurate, detailed and real-time picture of students' performance. They can enrich our assessment approaches while equipping our students with valuable skills that have real-world relevance in an era dominated by technologies and AI. Whilst we should consider incorporating technologies such as AI in our assessment approaches to keep our assessments relevant and aligned to the competencies and attributes of students, care should be taken only to include technologies where they enrich the student experience.

These are some of the principles of good assessment design that support the use of AI:

- ▶ The Principles of Assessment Design apply also to the use of AI in assessments;
- ▶ Technologies (including AI) should only be used if they make pedagogic sense and augment the end-to-end learning experience;
- ▶ Assessments, where appropriate, should promote AI literacy that prepares our students for the future in terms of tools, concepts and ethics;
- ▶ Assessments should encourage students to embrace the power of technologies and AI to support their learning ethically and constructively;
- ▶ AI can encourage students to understand the value of academic rigour;
- ▶ Assessment that uses AI can help students explore the impact of this new technology through their own educational experience, focusing on learning through assessments rather than just assessment of learning.
- ▶ Assessments should be designed to encourage criteria in which authentic human input complements AI, for example:
 - demonstrating higher-order thinking skills (such as critical thinking and reasoning skills);

- asking students to theorise, create an argument, and demonstrate understanding, rather than reproduce information;
 - applying knowledge and skills to real-world scenarios;
 - reflecting on the authentic 'lived experience' of the learner.
- The capabilities of AI are constantly evolving, creating a need for continuous evaluation in all assessment types.

Illustration



The importance of authentic assessments

By Simon Sweeney, University of York

I would like to reiterate an important point already expressed by students: the notion of authentic assessment, where the tasks involved have intrinsic value and meaning beyond pure achievement of a mark or grade.

This is very important as it implies principles that should underpin all assessment tasks (Brown and Sambell, 2021), including the notion that assessment should reflect the 'real world' (Lund, 1997) in which graduates will be employed.

Considering that in the 'real world' AI is likely to play an increasingly important role it is important to embrace AI within assessment processes. Educators should continue to use a wide range of assessment methods across a programme, and might want to see Pugh (n.d.) for a taxonomy of assessment methods.

- Brown, Sally and Sambell, Kay (2021) 'A Step-by-Step Guide to Designing more authentic assessments' Watt Works Quick Guides 31. Edinburgh: Heriot-Watt University. <https://lta.hw.ac.uk/wp-content/uploads/>

GUIDE-NO31_A-step-by-step-guide-to-designing-more-authentic-assessments.pdf

- ▶ Lund, J., 1997. Authentic assessment: Its development & applications. *Journal of Physical Education, Recreation & Dance*, 68(7), pp. 25-28.
- ▶ Pugh, S. (ed., n.d.) *A Compendium of Assessment Techniques in Higher Education: from students' perspectives*. Leeds: Leeds Institute for Teaching Excellence. <https://teachingexcellence.leeds.ac.uk/wp-content/uploads/sites/89/2018/10/PUGHcompendiumcomplete.pdf>

An example of an assessment that would have been difficult to solve using Bard or ChatGPT without attending or understanding class content

By Lorenzo Frigerio, Science, Engineering and Medicine

An example of an assessment where responses seemed creative and genuine was where students were asked to write a critical analysis of a paper that students had not seen/discussed before in class, but where students were explicitly asked to link their analysis to taught material covered in the classroom.

Specific example: Critically evaluate the article by Shomron et al, 2021 (full details given below) and discuss how these findings contribute to an emerging new model for ER exit site [a concept covered in the classroom].

Shomron et al., 2021. COPII collar defines the boundary between ER and ER exit site and does not coat cargo containers. JCB: <https://doi.org/10.1083/jcb.201907224>

The quality and uniqueness of each answer we marked was remarkable. We were specifically looking for links between the paper (not discussed in lectures) and the taught material, and that is where students seemed creative and genuine.

Concluding advice for educators

The learning journeys of our students, which includes assessments, are influenced and shaped by their environment. Part of their environment is now access to technologies such as artificial intelligence. Therefore, resistance, or attempting to ban use of technologies, will not only result in a losing battle but also is denying our students the opportunity to learn valuable skills such as technology literacy and responsible and ethical engagement with technologies. As educators, we need to consider the learning journey (the process) a student needs to undertake to generate the final output of an assessment. By focusing on the process and not just the output, this will enable us to consider where and how artificial intelligence can be embedded into our assessments while maintaining the validity and integrity of our assessments. For example, if the focus of an assessment is critical thinking and analysis, rather than the actual academic writing skills there is no harm in allowing students to improve the quality of their writing using artificial intelligence. One would argue this would level the playground for students where writing may not be their strength, or English is their second language and allows them to focus on the actual task.

Useful links:

- ▶ Principles of assessment design (ADC), including [guidance on designing assessment that supports the use of AI](#) from the 'AI in Education' subgroup of the WIHEA Diverse Assessment Learning
- ▶ QAA code, advice and guidance: Assessment (2018) [advice-and-guidance-assessment.pdf \(qaa.ac.uk\)](#)
- ▶ QAA webinars:
- ▶ ChatGPT: [How to use it as a force for good?](#)
- ▶ ChatGPT: [What should assessment look like now?](#)
- ▶ Rudolph, J., Tan, S., & Tan, S. (2023) ChatGPT: Bullshit spewer or the end of traditional assessments in higher education?. *Journal of Applied Learning and Teaching*, 6(1). <https://doi.org/10.37074/jalt.2023.6.1.9>

Chapter 2.5: Dialogue using AI, incl. Formative Feedback

Findings based on group meetings led by Lewis Beer



DALL-E 2, 2023g

Summary

AI can help us to rethink and reframe the roles and approaches of educators, students, and tools in the learning process. Our group focused on the use of AI in marking and providing feedback on student work, with a particular focus on formative rather than summative work. We discussed the issues currently faced by educators and students with regard to the marking/feedback process, and explored opportunities and dangers presented by AI. In this report, we present our reflections and recommendations, including links to reflective pieces and other useful resources that were shared by members of the group. These materials are also presented on a webpage: https://warwick.ac.uk/fac/cross_fac/academy/activities/learningcircles/future-of-learning/ai-dialogue-feedback

Background and key findings

AI presents an opportunity to rethink the students' learning process, and the ways in which educators and tools support that process. In the evolving conversations about the use of AI for assessment and feedback, some see this as a potential opportunity for a [cognitive revolution](#) that will re-define processes and support structures in education. In this chapter, we will focus on the use of AI for generating dialogue and formative feedback.

Marking student work and providing constructive, consistent, timely feedback can be an extremely labour-intensive process for educators. Receiving and making use of this feedback can also be frustrating for students, especially if they feel the feedback is unfair or hard to act upon, or if they believe other students are receiving more (or better) feedback. These challenges are regularly reflected in the results of the National Student Survey.

Recent developments in AI may offer support in addressing these challenges. AI tools can, to some extent, summarise student work and even give qualitative evaluations, and could potentially be used to support the provision of personalised feedback to students in a timely manner.

However, these same tools are also a source of anxiety in terms of how they might impact the learning process and the dialogue between educators and students. AI platforms are still developing, meaning that there are serious risks of either over- or under-estimating their current and future capabilities. Feedback produced by AI may be inaccurate and misleading, but there are also concerns that AI may 'replace' human markers.

Ultimately, we argue that AI raises questions (about the dialogue between educators and students) that are challenging but productive. In this section of the report, we offer some reflections, recommendations, and resources in the hope that these will provide an accessible 'way in' to this topic for those who are relatively new to it. By engaging directly with AI, and by reflecting on the nature of this engagement, teachers and learners can work together to foster constructive dialogue, identify opportunities, and address potential risks.

Case-studies and use-cases: using AI to generate formative feedback

Our group has created a series of blog posts to explore and reflect upon specific ways of using AI in the context of formative marking and feedback. These posts will be presented on the webpage alongside other materials from this section of the report.

We encourage readers to submit their own reflections for inclusion. Please contact Lewis.Beer@warwick.ac.uk if you wish to discuss this.

Using AI for Formative Feedback: Current Challenges, Reflections, and Future Investigation (Matthew Voice). In a brief essay and accompanying presentation, a lecturer in Applied Linguistics tests the capabilities of ChatGPT in evaluating his own writing, and explores the challenges (for teachers and students) posed by Large Language Models.

Forthcoming: Who Uses AI, How, and When? (Matthew Voice). Following on from the previous post, Matthew Voice raises important questions about the various motives that might prompt students to use AI, and asks how universities can adopt a reasonable and realistic approach to supporting students' engagement with these tools.

Forthcoming: AI Feedback Systems: A Student Perspective (Mara Bortnowschi). An undergraduate student in Warwick Medical School reflects on how AI might impact the student experience. How are the new platforms different from more familiar AI feedback systems? How should students make use of AI feedback? And how can universities manage this conversation responsibly to counteract media-fuelled anxieties? – In addition, see [here](#), for Mara's most recent blog post.

Forthcoming: Using AI to Evaluate Film Criticism (Lewis Beer). This post explores ChatGPT's ability to provide qualitative analysis on critical writing, using publicly available film reviews as 'substitute essays'.

AI Platforms for Feedback and Marking

Below are some recent examples of AI programmes designed to facilitate feedback and marking. We present these in the same spirit as the other resources in this section: as interesting and specific examples of how AI is being used, to help prompt discussion among educators and students.

AI Essay Analyst (in-house Warwick). See the article, [Pedagogic paradigm 4.0: bringing students, educators and AI together](#) (Fischer, Times Higher Education), and a [blog post with further technical details](#) on the Jisc National Centre for AI website. The tool provides students with optional formative feedback following submission of draft essays or dissertations prior to the formal submission. Turnitin scores are not affected and data privacy is safeguarded. The tool is intended to augment the feedback process rather than fully automating it, it provides students with agency, creates a conversation starter with fellow students or tutors, and aims to 'level the playing field' by giving all students the opportunity to receive formative feedback.

Graide (University of Birmingham). See the [programme website](#) and the article, [Artificial intelligence offers solution to heavy marking loads](#) (University of Birmingham website). This programme grew out of a PhD thesis in the University of Birmingham's School of Physics and Astronomy. It is designed to learn an assessor's marking style and assess not only final answers, but also the student's workings. The AI aims to mimic the assessor when they are most alert and attentive to detail, not when they are fatigued from a long period of marking, and so represent the 'best' version of that assessor.

PhysWikiQuiz (University of Konstanz, FIZ Karlsruhe, NII Tokyo, University of Göttingen). See the [programme website](#) and the article, [Collaborative and AI-aided Exam Question Generation using Wikidata in Education](#) (Scharpf et al.). PhysWikiQuiz is a physics question generation and test engine. It provides a variety of different questions for a given physics concept, retrieving formula information from Wikidata, correcting the student's answer, and explaining the solution with a calculation path. Two of the purported selling points of this programme are: 1) that it gives each student a unique set of questions and 2) that it draws upon a community of expertise (collated on Wikidata). It is thereby intended to be

more learner-centred and expert-led than non-AI-generated forms of assessment.

Teachermatic (Geoff Elliott, Oliver Stearn, Peter Kilcoyne). The [Teachermatic](#) website and app, founded in 2022 by e-learning specialists, aims to provide educators with tailored AI generators to help them produce learning materials. Most of the tools advertised do not directly support marking and feedback, but they can generate assessment rubrics and, most interestingly, SMART goals that are tailored to a learner's specific challenge or objective. Services like this could potentially be used in creating formative assessment tasks and supporting the educator/student dialogue surrounding these tasks.

Recommendations for educators and students

The resources we present here do not represent definitive, future-proofed guidance about the use of AI for formative marking and feedback. However, our group has agreed on some key recommendations – applicable to both educators and students – to support constructive engagement with AI-generated feedback.

- ▶ **Question assumptions about what AI can or cannot do.** Beware of accepting AI-generated feedback at face-value, and always examine it with a critical eye. At the same time, beware of making assumptions about AI's limitations: what are these assumptions based on, and have they been rigorously (and recently) tested?
- ▶ **Reflect on preconceptions about the learning process.** How do you understand the process by which you and others learn, or by which we produce scholarly 'work'? What do you think about the role of writing in education? What do markers do when they assess students' work? What is the optimal timing for the formative and summative assessment process? And how might AI challenge these beliefs?
- ▶ **Use AI to support pedagogical innovation.** Consider how new AI platforms might enhance innovative practices such as peer-to-peer learning, co-creation, student-devised assessments, online and dialogue-based assessments, and various forms of collaboration. Might the rise of AI open up conversations about other (non-AI) forms of technology-enhanced learning, which may now seem more accessible to educators and students?
- ▶ **Request top-down support and resources.** Universities must enable students and academics to engage with AI-generated feedback in a competent, responsible manner, and to develop 'using AI' as a skill. We all have a role to play in making the case for these support structures, and in co-creating them to ensure they are mutually beneficial for all members of the educational community.

Useful links

The following reflective pieces by educators are useful entry points for those new to AI:

[The potential of artificial intelligence in assessment feedback](#) (Elizabeth Ellis, Times Higher Education). Among other interesting points, Ellis notes the potential for AI as a tool for commenting on the 'technicalities' of academic work (referencing, institutional processes, etc.), and as a tool for providing feedback in the form of 'structured questions' that prompt dialogue, rather than 'judgements' handed down to the student.

[Facing facts: ChatGPT can be a tool for critical thinking](#) (Nathan M. Greenfield, University World News). Greenfield, an English professor, reflects on universities' traditional reliance on the 'literary essay' as a mode of assessment, how ChatGPT may affect this, and how educators might respond. He also provides an accessible account of how ChatGPT was developed and how its mode of thinking compares with the workings of the human mind.

[Four lessons from ChatGPT: Challenges and opportunities for educators](#) (Centre for Teaching and Learning, University of Oxford). This article, published in January 2023, aims to synthesise discussions about ChatGPT up to that point, and to summarise key points for educators to consider. It offers a clear and balanced take on issues such as plagiarism, ChatGPT's potential as an educational tool, and the broader landscape of AI platforms. The article also contains many links to other think-pieces and resources, including EduTools and FutureTools (linked below).

[More AI news: Incremental but meaningful progress - From models to products](#) (Dominik Lukeš, LinkedIn). Lukeš discusses how plugins will enhance ChatGPT's capabilities, but sounds a note of caution regarding the platform's hallucinations. He also shows how AI can enable people to learn new skills faster than ever. These reflections are useful for educators grappling with the accuracy and inaccuracy of AI-generated material, or exploring how AI can be used as an educational tool.

[A First Response to Assessment and ChatGPT in your Courses](#) (Lorelei Anselmo, Tyson Kendon, and Beatriz Moya at the Taylor Institute for Teaching and Learning at the University of Calgary).

For those who want to explore this topic in more depth, the following platforms offer a wealth of resources and guidelines:

[EduTools](#). A collection of tools and models related to education, assembled by Dominik Lukeš. This resource was set up following the release of ChatGPT, but includes a very wide range of links and tools, beyond those that use AI, that may be useful to teachers and students. There are also many links to online guides and think-pieces about AI tools.

[FutureTools](#). This site, run by Matt Wolfe, maintains up-to-date lists of tools based on AI technologies and articles about AI. It also provides a glossary of key terms and links to Wolfe's YouTube channel.

[PromptEngineering.org](#) and [Prompt Engineering Guide](#). The phrase 'prompt engineering' refers to the effective use of prompts when using AI language models such as ChatGPT. These two websites are intended to help users improve their interactions with AI.

Chapter 2.6: AI as a driver of Digital Transformation in Education

By Isabel Fischer, partly based on discussions with Natasha Nakariakova, Warwick's e-assessment lead.



DALL-E 2, 2023h

Summary

In this chapter we outline the need for Warwick to start a holistic digital transformation journey to retain a competitive edge. We explain how adopting principles of digital transformation would be beneficial for AI in education. We also discuss some of the current limiting aspects of developing in-house AI-based innovations for educational purposes before outlining the constraints of delivering in-person online assessments at scale.

Background to Digital Transformation in Higher Education

As outlined in the *Preface*, nearly 100 years ago Sidney Pressey introduced a '[teaching machine](#)', foreseeing that educational science combined with educational technology will be able to modernise education. Since then many digital tools were introduced, most aiming to replace or augment specific aspects of education rather than reviewing education holistically. Several universities have relatively recently embarked on a holistic Digital Transformation journey spanning Education, Research and Information Technology. This includes devolved and fragmented universities, such as the [University of Oxford](#), and more centralised universities, such as [Imperial College](#). Four months ago JISC published a [framework for Digital Transformation in Higher Education](#).

To embark on a digital transformation journey that allows Higher Education to fully embrace AI and other digital trends in education (e.g. virtual reality and data analytics reflected in [learning management systems \(LMS\)](#), and [intelligent tutoring systems \(ITS\)](#)), there are a number of key guiding principles. For example, 'Digital' (capturing Technology and Data) should not be considered on its own but in conjunction with 'People' (Students, Staff and other Stakeholders) and 'Processes' (including strategies, culture, support infrastructure, and also pedagogy) that connect People and the Digital.

Furthermore, there is a need for increased agility which might not necessarily always be compatible with a system of termly committee meetings. While there remains, of course, a need for academic rigour and IT system security, for some other aspects, agile processes that allow for experimentation might become necessary to pilot things fast and 'fail fast' at a relatively low cost. One prerequisite to testing out new ideas might be to differentiate between 'production environments' and 'independent sandbox environments on a cloud server' which do not affect the well-established systems. Figure 2.6.1 illustrates the different stages of product and service development.

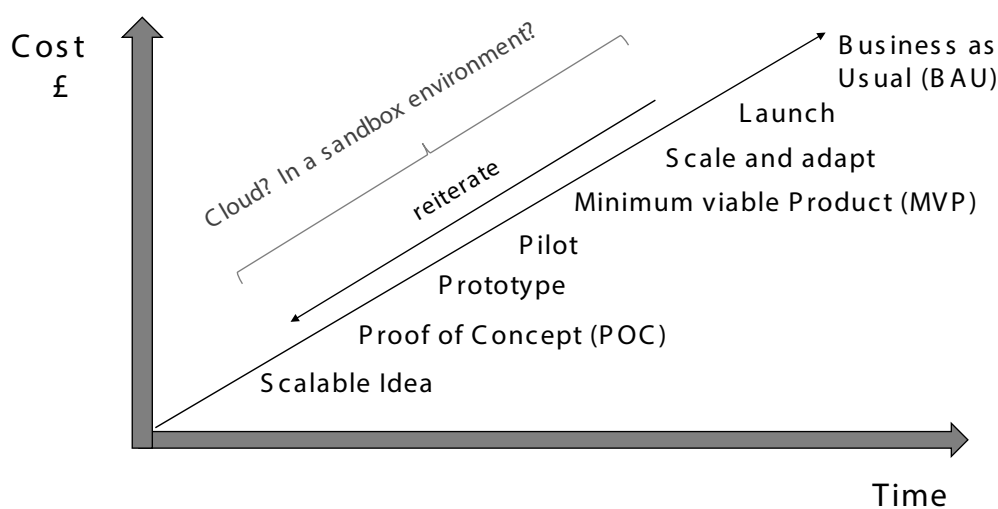


Figure 2.6.1. Stages of product or service development, building on: <https://danikahil.com/2021/01/envisioning-to-delivery-poc-prototypes.html>

The purpose of this report is to focus on AI in education rather than Digital Transformation, however, in the remainder of this chapter we provide first three examples of ideas for using AI for educational purposes, before discussing opportunities and constraints when delivering in-person online assessments.

Five illustrative learner-facing AI ideas that would benefit from digital transformation principles

There are many opportunities to deploy AI to augment various aspects in a university setting. In this section we outline five illustrative learner-facing use cases.

1. An interactive Chatbot Reading List

Generative AI has been used in a research setting at Warwick to offer users a chatbot interface to learn more about articles produced by researchers of Warwick's Gillmore lab (see chapter 3.6.1 of this report). Using a similar set-up, we outline in chapter 3.6.2 how we could use generative AI to produce bespoke module (or course/programme) reading lists where students could engage with generative AI to understand selected high-quality journal articles. While this idea might make sense to develop at a relatively low cost, currently we would need to progress the idea through research ethics approval, educational committees, IT scheduling, and resource allocation before we could even develop a 'proof of concept' to determine if it is a worthwhile undertaking.

2. Tools to create effective online communities

Students who feel a sense of belonging to the Warwick community tend to be more likely to engage in their studies. Especially commuting students, but also other students, increasingly rely on online communities. Some of these communities could be built around modules where rather than having traditional forum question and answers (with in places repeating questions), AI could 'augment' the discussions and provide students with updates on previous discussions while keeping 'humans in the loop' to add information and dialogue.

3. Mini-vivas

Verbal communication skills are regarded as an important skill by employers, yet are currently perceived by [students as one of their weaknesses](#). 'Communicating AI tools', available as 2D-dialogues and in virtual reality settings might be able to help students become better oral communicators by giving feedback on aspects such as clarity and concision as well as content. They might also allow for role plays and gamifications (desired by students, see *Part 1*).

An increasing number of employers use AI for the first round of job interviews where applicants have to answer several questions and AI then evaluates the results. While the technology does not yet seem to be advanced enough to ensure fairness and accurate marks, perhaps we could deploy these existing AI applications, not just to improve verbal communication skills, but also to encourage students to deeply engage with their course topics: In addition to the authentic assessments outlined in chapters 1.4, 2.4 and 3.4, perhaps we could pilot AI-assessed mini-vivas which do not affect the overall marks and which are assessed instead on a pass or fail basis, with fails receiving further (in-person) viva opportunities.

4. Programme-level assessments

There seems to be a broad consensus across the educational sector that students tend to be 'over-assessed' and that the sector should move away from several assessments per module to synoptic assessments at programme (course)-level. Whether written or oral, AI now seems to offer the opportunity to combine different topics in one assessment. Although perhaps not truly synoptic and integrated, technology certainly allows already now (i.e. Warwick already has the technology) for an easier combination of topics across modules than was possible before, an easier application of reasonable adjustments, and an easier separation of submitted pieces of work for allowing allocation of marking across different assessors.

5. A formative feedback tool to help students when writing their essays and dissertations

Student contributing to *Part 1* (see Chapters 1.5 and 1.6) and also Chapter 2.5 referred to a generic, in-house, formative feedback tool we developed to help Warwick students improve writing their essays and dissertations. Figure 2.6.2 provides a simplified illustration of the technical set-up of the tool where, instead of the now more known GPT (Generative Pre-trained Transformer), we use BERT (Bidirectional Encoder Representations from Transformers). Underpinned by research ethics approval and having received research funding we were able to follow the steps outlined in Figure 2.6.1 until we had developed a minimum viable product (MVP), ready to be scaled as a stand-alone tool in a cloud environment, but not ready for a Business as Usual (BAU) system integration.

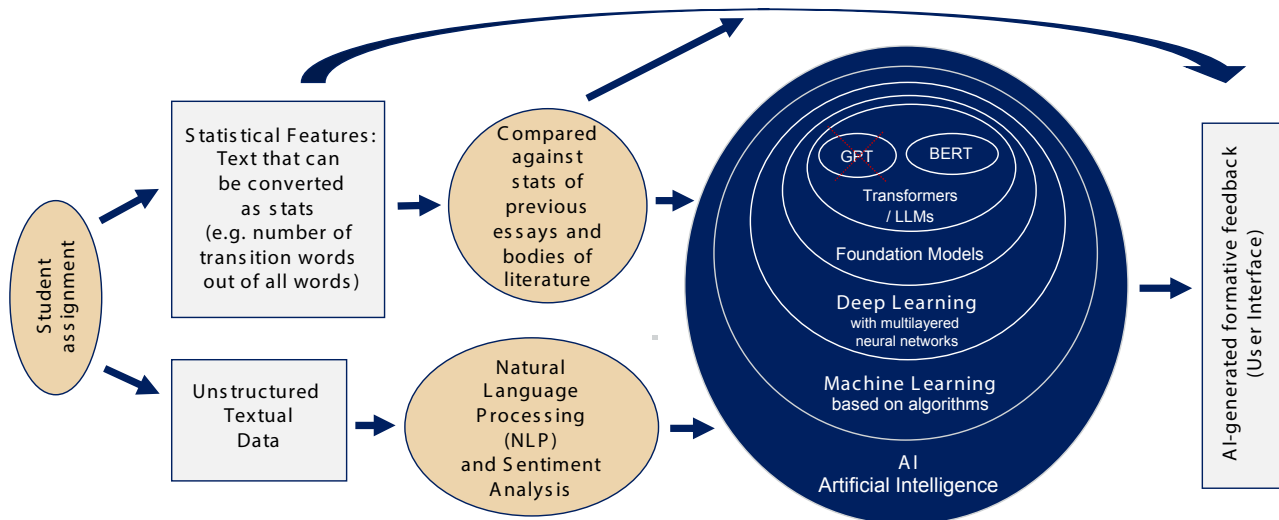


Figure 2.6.2. Simplified overview of the set-up of an in-house developed formative feedback tool for essays and dissertations, building on Fischer (2023): <https://doi.org/10.1177/20438869231178844>

In-person online assessments

Throughout the report we have emphasised the need for students to become AI-literate and to be offered opportunities to use novel tools and technologies for assessments, with assessment design being key to uphold academic integrity. Warwick would want to continue to offer a variety of assessments, each testing different knowledge and different skills. Thus, there are still many assessments that need to continue to be set in controlled exam conditions.

To avoid students having to write by hand and for examiners having to decipher long, handwritten assessments, a popular trend across the higher education sector is the move to in-person online assessments with general internet access disabled, known as ‘in-person exams on a computer’ or ‘in-person typed exams’ in some other universities. Warwick’s e-assessment team (part of the Flexible and Online Learning Division (FOLD)), supports several technologies for e-assessments, such as WAS (Wiseflow) an QMP (Questionmark).

There are several options to provide access for in-person online exams - halls with existing desktops, (sports halls) with the University, buying or renting laptops, or alternatively BYOD (Bring Your Own Device). Warwick currently has limited capacity for the first option with some ITS supported rooms in the Library used to full capacity. The School of Engineering and Life Sciences are also using their computer rooms to full capacity, especially as this is in conjunction with teaching needs. To date, Warwick has not trialled BYOD for in-person online exams as it first requires policies (including contingency plans), technical support, and additional power sockets physically in rooms. The University now needs to consider if it would want to invest in further resources for supporting this type of assessments (human resources, hardware and facilities).

Conclusion

In this chapter we have briefly outlined the need for Warwick to start a digital transformation journey and illustrated that this journey would be beneficial for AI in education, both for innovatively using AI to develop educational tools, as well as for delivering in-person online assessments.

Part 3: Additional Contributions per Theme



DALL-E 2, 2023i

Chapter 3.1: Beyond writing: Employability skills that students can practice when using generative AI tools

By Matt Lucas and Isabel Fischer

In response to the Russell Group principles of the use of generative AI¹ and building on a previous blog we wrote for the Warwick Journal of Education² the aim of this contribution is to support students' and staff's AI-literacy and to help lecturers *reflect on the employability skills that their students can learn when deploying Generative AI Tools (GAITs)*. **It is not a chapter on actual tools and their features but on the skills that students can learn by using them.** Some are new skills, some are the similar ones to before but are building on different input. This chapter is based on a collaboration between a potential employer (working for a major tech firm) and a WBS academic.

We build on the preliminary findings of a study of 120 Masters-level students who were asked to reflect on their use of AI when writing an academic blog on a subject of their choosing within a defined topic area. Initial findings indicate a widespread student *use of AI mainly for achieving clarity of expression aligned to the assessment and marking criteria*. This indicates to us two things: First, we have to be more varied on the assessment and marking criteria so that students receive signposting of what knowledge and skills they are meant to demonstrate (with the required skills possibly being different to what we were looking for at the start of last academic year). Second, to enhance students' AI literacy we need to adapt our teaching and share more effectively with students the opportunities for learning that AI provides beyond the actual writing of documents.

As part of this chapter we try to encourage fellow educators to consider how they can work with students on learning and practising skills that are currently seen as relevant for many future careers in a world disrupted by AI, namely:

1. Cognitive flexibility, abstraction and simplification
2. Curiosity and creativity, including prompt engineering
3. Personalisation, reflection and empathising to adapt to different audiences
4. Critical evaluation of AI and ethical concerns

For each of the four areas we explain the relevance for student learning, before outlining how we have incorporated these four skills into students' assessments in the recent term.

Cognitive flexibility, abstraction and simplification

1 https://russellgroup.ac.uk/media/6137/rg_ai_principles-final.pdf

2 https://blogs.warwick.ac.uk/wjett/entry/building_knowledge_on/

We suggest that students need to have the cognitive flexibility to try different approaches to gain some understanding of a multitude of complex topics and to be able to simplify it for others. They might achieve this through abstraction. To explain, we suggest reflecting briefly on the work of Grace Hopper (1906-1992) who developed the Common Business-Oriented Language (COBOL) and the first compiler. Both innovations were early examples of programming *abstractions* - something that hides complexity behind a simplified layer. In the case of the compiler, it turns a higher-level language into an executable machine code. Abstractions are also useful for students not involved in software development, as they need to be able to explain concepts in simplified terms (note, we are aware that GenAI is also very good at simplifying terms).

Curiosity and creativity, including prompt engineering

Studies such as [Zhou22] suggest LLMs are the next evolution of computing abstractions, similar to a new programming language. By teaching students to engineer requests to generative AI / LLMs, we can now get far more detailed output in far fewer, but more naturally expressive, lines of code. The natural language nature of AI prompts means that it is not just an activity for computer scientists. For example, a medical student might use ChatGPT to consider the prompts that might suggest a particular diagnosis. Student-led refinement of prompts demonstrates their ability to think carefully about the problem, with the goal of the LLM getting as close and as quickly as possible.

Personalisation, reflection and empathising to adapt to different audiences

A theory that has been synthesised through a personal experience, building on [David Kolb](#)-style theories of [experiential learning](#) might be more likely to be remembered. Consider assignments that invite personal reflection and thought and how LLMs can augment them. For example, using Bard and/or ChatGPT to explore the pros and cons of relocating a retail business from a city centre to an out-of-town retail park, and then applying the findings to an example business in the student's own town; how would the situation in the student's chosen area differ from the AI-generated findings, and why? This approach is designed to allow students to apply and extend points they extracted using LLMs, to reflect on personal experiences and then, by empathising with different audiences to adapt findings to different audiences.

Critical evaluation of AI and ethical concerns

Encouraging students to complement the output from LLMs leads naturally into a third technique in which students can develop deeper understanding of their subject: critical evaluation. This is a core criterion for both undergraduate and postgraduate modules and is defined by the WBS assessment guidance as "Showing capacity for original thought by questioning relevant arguments and/or identifying their strengths and weaknesses". While critical evaluation is typically applied to academic literature and the student's own experiences, it is perfectly relevant for use with LLM output too. Siva Vaidhyanathan, Professor of Media Studies at the University of Virginia, [describes how he uses LLMs](#) to produce essays in his own style, and then gets students to critique the output. This technique can be used in many ways, from critical evaluations of complex essay-style output to smaller sets of simple observations. The aim of such evaluation is to promote higher-order thinking; to get the students to not blindly accept what LLMs are telling them and to consider the wider societal and environmental consequences as well as ethical concerns. For ethical concerns we discussed two teaching case studies we wrote on AI Ethics and Sustainability ([Fischer et al., 2021](#) and [Fischer, 2023](#))³. There are many other sources to stimulate AI Ethics-related discussions, start, for example, with Yuval Noah Harari's talks on AI Ethics and then move towards academic literature (for recommendations see also chapters 1.3 and 1.6).

Which assignments did we implement to encourage students to practise and learn these skills?

We are aware that LLMs are evolving fast and that we will need to monitor and consider new advancements on an ongoing basis. But for now, we thought that the following four assessment aspects were useful new additions to strengthen students' skills and competencies:

³ <https://journals.sagepub.com/doi/full/10.1177/2043886920961782>
And <https://journals.sagepub.com/doi/full/10.1177/20438869231178844>

(1) Cognitive flexibility, abstraction, and simplification: We asked students to draw Mind Maps and Concept Maps to explain their writing.

(2) Curiosity, including prompt engineering: We asked students to reflect on the prompts they used and how they refined them to get more appropriate results.

(3) Personalisation, reflection and empathising to adapt to different audiences: We asked students to reflect on their learning using AI as well as about the ethical risks they foresee going forward.

(4) Critical evaluation of AI: We allocated classroom time to discuss AI ethics, focussing on the aforementioned two case studies. However, we did not make this point clear enough in the assessment criteria when asking students to reflect in 500 words on the use of AI for the assignment and not all students used the 500-word reflection to consider wider ethical concerns.

Concluding comments: Teaching AI-related skills is often subject-specific and has to be carefully balanced with teaching content (i.e. knowledge). The aim of this chapter was to point out that educators might find it worthwhile to consider the range of transferrable employability skills that students can practice when deploying AI tools and to make these skills very explicit to students. By making the transferrable skills very explicit, students are not only more likely to continue to build on these, they are also more likely to be able to talk about the skills that they can bring into their future work, for example during a job interview. Considering the worries about their future that students have expressed in *Part 1*, it also might reassure students that there continue to be future career opportunities for them based on the knowledge and the skills acquired at university.

Finally, if interested in further dialogues on pedagogy, such as reflections on '[Teaching the unknown](#)', then listen to the University of Warwick [LDCU podcasts](#).

Chapter 3.2: Useful links for AI in Teaching and Assessment

By Maria Walker, Teaching & Learning Enhancement, WBS

Introduction

This page collates and signposts guidance and resources for faculty and professional services staff, structured around the following areas and drawing on good practice from elsewhere within the University and from other institutions:

- ▶ AI and academic integrity (including policy, case detection and student communications)
- ▶ AI and assessment design
- ▶ AI and teaching delivery (including in-class delivery and student support).

AI and Academic Integrity

The University's guidance is available at: [Academic Integrity and Artificial Intelligence](#)

Other resources

- ▶ QAA: ChatGPT and Artificial Intelligence
The Quality Assurance Agency for HE's repository of guidance on AI, including past and future webinars, and briefings and guidance on academic integrity and on designing authentic assessment. Updated weekly.
- ▶ OpenAI: [Educator Considerations for Using ChatGPT](#)
Guidance from the company behind ChatGPT discussing risks and opportunities, personalised teaching, academic dishonesty and detection, ethics, truthfulness, biases, over-reliance, equity and access, career outlooks and disclosure of use. It also warns against the use of ChatGPT for assessment.
- ▶ Turnitin: [Academic Integrity in the age of AI](#)
A collection of resources from the company behind plagiarism-detection software, including various guidance for reducing the likelihood that students will/can use AI-generated text in assessment.
- ▶ Compton, M. (2023). *AI Text Generators (not ChatGPT) on Essays, Citations and Plagiarism*. University College London, 10 March.

A blog post evaluating ChatSonic and Jenni.ai and their ability to (help) write essays with genuine references.

- ▶ Cotton, D.R.E, Cotton, P.A. and Shipway, J.R. (2023). *Chatting and Cheating: Ensuring Academic Integrity in the Era of ChatGPT*. *Innovations in Education and Teaching International*, 13 March. A peer-reviewed journal paper written by ChatGPT, followed by a discussion written by the authors. It discusses the opportunities and challenges for assessment presented by ChatGPT.
- ▶ Webb, M. (2023). *AI Writing Detectors: Concepts and Considerations*. JISC National Centre for AI, 17 March. Another blog from the JISC National Centre for AI, explaining how AI detectors work, discussing different uses of AI in assessment writing and whether detectors will flag these, and outlining policy considerations dealing with detector output.
- ▶ Michael Webb (JISC): *ChatGPT and Its Impact on Education* (27:26 min video) An online presentation demonstrating how ChatGPT works, how it performs against AI detectors (and how these can be defeated) and how and why it hallucinates false information.
- ▶ QAA: *ChatGPT: To Ban or Not to Ban?* (58:14 min video) A panel discussion covering whether it is possible to ban or detect AI, responses to the major concerns with ChatGPT, trusting and partnering with students, academic integrity in response to AI and the difference between AI adopters and future 'AI natives'.

Assessment Design

- ▶ Gonsalves, C. (2023). *'On ChatGPT: What Promise Remains for Multiple Choice Assessment?'* *Journal of Learning Development in Higher Education*, 27. An opinion piece looking at the role of multiple-choice questions in assessment following the advent of ChatGPT and how such questions can be designed to exploit the current limitations of AI.
- ▶ AdvanceHE: *Authentic Assessment in the Era of AI* A project from Advance HE (formerly HEA) open to colleagues at member institutions (including Warwick), looking at the role of authentic assessment in response to the challenges presented by AI. Project outputs include blogs, tweet chats and webinars.
- ▶ David Smith (Sheffield Hallam): *How AI has Answered the UnGoogleable Exam Question and What to Ask Next?* (15:44 min video) A presentation looking at how well ChatGPT performs at answering different types of assessment question and a discussion of the future of written assessment.
- ▶ Debbie Kemp (Kent): *ChatGPT: Love it or Hate it, but Ultimately Embracing it!* (15:45 min video) An account of a module leader who, following the release of ChatGPT, adapted their MBA online open book exam to embrace AI. The discussion addresses the importance of transparency and discussion with students.
- ▶ Abdullahi Arabo (UWE): *Utilizing ChatGPT for Offensive Cybersecurity* (15:03 min video) A presentation outlining the options for the future of assessment and then exploring some examples of assessment that incorporate or resist the use of AI.
- ▶ QAA: *ChatGPT: What Should Assessment Look Like Now?* (58:47 min video) A panel discussion looking at the role of authentic assessment and the need for a focus on process not product of learning. If time is short, the talk from 37:57 - 49:12 is particularly interesting.

AI in Teaching

- ▶ Mollick, E.R & Mollick, L. (2022). *New Modes of Learning Enabled by AI Chatbots: Three Methods and Assignments*. Working Paper. A discussion of how AI may be used to overcome three barriers to learning: improving transfer, breaking the illusion of explanatory depth, and training students to critically evaluate explanations. The paper includes sample prompts and assignments.
- ▶ Mollick, E.R & Mollick, L. (2023). *Using AI to Implement Effective Teaching Strategies in Classrooms: Five Strategies, Including Prompts*. Working Paper. Guidance on how to use AI to facilitate the implementation of beneficial but otherwise time-consuming teaching strategies by generating examples, explanations and low-stakes tests, summarising common misconceptions from student feedback and linking key themes across a module.

- ▶ Liu, D. (2023) 'How Sydney academics are using generative AI this semester in assessments'. *Teaching@Sydney*, 8 March
Case studies of modules where AI has been introduced: as a research partner; as an assistant in analysing texts; to support creativity and stakeholder interactions; to unpack ideas and increase exposure to literature; to improve student writing and language learning; to assess the process of learning through improving ChatGPT's outputs; and in generating and analysing ChatGPT essays to discover what it means to be human.
- ▶ Mollick, E. (2023). 'The Future of Education in a World of AI'. *One Useful Thing*, 9 April.
A blog post analysing the impact of AI on education and discussing how it can be used to shape future teaching. The *One Useful Thing* blog is updated weekly with posts about the latest developments and insights into AI in education.
- ▶ Nerantzi, C. et al. (eds) (2023). *Creative Ideas to Use AI in Education*. #creativeHE. (Work in progress)
A collaborative open educational resource project to develop a curated collection of 101 ways to use AI in education.
- ▶ Webb, M. (2023). *Getting Started with ChatGPT*. *JISC National Centre for AI*, 16 March
A series of short guides to 1) *Understanding ChatGPT*; 2) *Drafting lesson plans*; 3) *Quizzes*; and 4) *Feedback on your writing*
- ▶ Thinkific: ChatGPT for Educators (short online introductory course)
A short course designed by a human but scripted, presented and illustrated by AI, providing step-by-step guidance to using ChatGPT and some potential ways that it can be used in teaching.
- ▶ QAA: ChatGPT: How Do I Use it as a Force for Good? (54:24 min video)
Panel discussion covering how to write good prompts, responding with students to the advent of AI, ways to use AI as an educator and how ChatGPT can help students and reduce inequalities.
- ▶ Bernice Yeo, Jennifer Seon & Sopio Zhgenti (UCL students): The Impact of AI on Higher Education Students (14:22 min video)
A presentation by postgraduate Education students discussing the difference between AI as a tool to help you think vs AI as a tool that thinks for you, and how education needs to support students develop the skills to use AI critically and effectively. (Note there is an error near the start: when the video says ChatGPT is not a generative AI, it should say it is not an artificial general intelligence.)
- ▶ Insiyah Rangwala (Regent's UL student): *Studying with AI: A Student's Perspective* (11:26 min video)
A presentation by a postgraduate data science student looking at how they use AI to help with studying.
- ▶ Ethan and Lilach Mollick (Wharton): *Unlocking the Power of AI: How Tools Like ChatGPT Can Make Teaching Easier and More Effective* (58:00 min video)
An engaging and informative demonstration of how ChatGPT can be constructively used in teaching and assessment.

Chapter 3.3: Principles Governing the Appropriate and Ethical Use of Online Assessment Data

In this report we focus extensively on Academic Integrity (Chapter 2.3 and Appendix 3). However, ethics is much broader (see chapter 1.6). This chapter provides an overview of the principles governing the appropriate and ethical use of online assessment data. This is an extract of a document that was developed by a team of academics, students and Professional Services colleagues from across the University of Warwick in February 2023. The team was led by *Professor Caroline Elliott (Economics) and Russell Boyatt (Information & Digital Group)*.

Introduction

In recent years the use of online student assessments including examinations has grown substantially both across the University of Warwick and across the Higher Education sector in general. This growth is expected to continue, and with it the data produced by online assessments. Hence, it is timely and important to agree a set of principles governing the management of these data that will always include sensitive information. This document provides a set of principles to be adopted to ensure the appropriate and ethical management and use of online assessment data across the University of Warwick. The principles relate to the collection, storage, access, use and retention of data arising out of any summative assessments (including but not restricted to examinations) that are conducted online. Uses of these data include analyses of student attainment and pedagogy research projects. These

data will be owned by the University of Warwick.⁴ These principles develop and extend an earlier set of principles developed by the University to ensure the ethical use of student learning analytics data.⁵ Issues relating to academic integrity in the context of student online assessments are beyond the remit of this document but the University of Warwick remote proctoring policy should be noted.⁶

It is intended that the set of principles below address the following key issues relating to managing student online assessment data:

- ▶ Data Ownership & Control
- ▶ Privacy and Anonymity
- ▶ Transparency
- ▶ Consent
- ▶ The use of data to help others while doing no harm
- ▶ Deletion of Historical Data⁷

Principles

The overarching principle governing online assessment data is that:

The University will undertake the capture, processing and analysis of information in alignment with the core University values of dignity, respect, no discrimination, and recognising the importance of all students and colleagues and the benefits of education as a positive force.^{8 9}

Further Principles

Principle 1

The University of Warwick will use and extract meaning from online student assessment data. The aim is to benefit individual students and broader current and future student cohorts.

Principle 2

Students should not be defined by their data or interpretation of that data.

Principle 3

The purpose and the boundaries regarding the use of online assessment data should be well-defined and clearly communicated to students and colleagues.

Where possible, communication to students should be in person as well as information being available online.

Principle 4

The University should be transparent regarding the collection and storage of data and will provide students with the opportunity to update their personal data and consent agreements at regular intervals.¹⁰

For example, informed consent mechanisms must be carefully designed to ensure that these are not overlooked and fully understood by students and staff.¹¹

Principle 5

4 Note that the ethical use of any data held by external providers (for example Turnitin) will be covered by the legally binding contracts agreed between the University of Warwick and those providers.

5 'An Ethical Framework for use of Student Data in Learning Analytics', University of Warwick (2019).

6 <https://warwick.ac.uk/services/aro/dar/quality/az/acintegrity/framework/rppolicy/>

7 See Slusky (2020) for discussion of some key principles relating to student online assessment data, and see Skene *et al.* (2022) for discussion of ethical issues and principles relating to the use of these data in learning analytics research.

8 <https://warwick.ac.uk/about/values/>

9 Note that literature exists on the ethical use of data, see for example Young *et al.* (2020) on the ethical use of data in the era of big data, and Mandinach and Jimerson (2021) on the ethical use of data specifically in education contexts.

10 See Custers (2016) for guidance on expiry dates for informed consents.

11 See Jones (2019) for a helpful guide to the design of informed consent mechanisms.

Online assessment data should be stored securely with access carefully controlled. Data should not be retained beyond when the data may be useful.

Decisions need to be taken as to the academic and professional services colleagues who will have access to data at different levels of granularity.

Principle 6

Student representatives should be involved in the co-design and review of relevant aspects of collecting, managing and using online assessment data.

For example, student representatives should be consulted on informed consent mechanisms and the design of any targeted interventions that rely on online assessment data.¹²

Principle 7

Modelling and interventions based on analysis of online assessment data should be statistically sound. Individual students should not be identifiable, with student data records anonymised prior to any modelling work undertaken. Sample sizes should be sufficiently large that the assessment outcomes of individual students should not be identifiable.

Chapter 3.4: Reclaiming Learning Spaces with Student Devised Assessments

By Heather Meyer & Elena Riva, IATL

The Institute for Advanced Teaching and Learning (IATL) supports the University's Education Strategy and specialises in educational innovation through collaborative, interdisciplinary teaching and student research. In particular, we develop creative pedagogical approaches to cultivate 'radical interdisciplinary' learning - a form of interdisciplinarity that questions the dominant structures of knowledge and education with a view of transforming it.

As such, we are well-placed to innovate in the area of assessment - providing students from across the university the opportunity to experiment, take risks and personalise their assignments according to their own personal, academic and/or professional interests and goals. To encourage a student-centred and student-led approach to assessment on our UG and PG modules, we work with four key interdisciplinary criteria: [collaboration, critical thinking, dealing with uncertainty, and reflection](#). These features of interdisciplinary learning give us the opportunity to create assignments through which students are empowered to personalise.

As an example, many of our IATL modules feature a 'Student-Devised Assessment' (SDA) as the culminating opportunity for students to showcase what they've learnt on their module. In this format, students not only negotiate a research topic of their choice with the Module Convenor(s), but also the medium/format through which they'd like to articulate the core message of their research. While conventional approaches to communicate research are supported (e.g. essays, academic posters, presentations), the SDA encourages creative research outputs to non-specialist, interdisciplinary audiences. Examples of IATL SDAs include poems; digital museums; autoethnographies; paintings; fashion shows; creative writing pieces; and musical compositions. These varying formats are accompanied by a reflective piece (written, audio or visual) through which the student expands on the thought processes that went into their research; contextual information, subject area knowledge, and/or critical evaluations deemed necessary to illustrate holistically their work. To show the authentic nature of this form of assessment, IATL has hosted [exhibitions](#) (both in person and virtual) of the SDAs of students enrolled on the 'Genetics: Science and Society' module taught by Dr Elena Riva.

IATL's work in innovative assessment practices (including the design of assessment guidance and robust marking criteria schemes to encourage consistent, equitable and inclusive evaluation of this work) has been praised as sector-leading by the department's External Examiners over the years. In 2023, this work has once again been commended - this time as a convincing strategy to encourage academic integrity,

¹² Note that students participated in the working group whose work led to the development of this Principles document.

personal development and investment in learning, while also facilitating the ethical use of AI in student assignments. The aforementioned four features of interdisciplinary learning on which IATL's provision of teaching and learning is centred affords us the space to encourage student-led, student-centred, and student-inspired assignments that are humanised enough to sincerely challenge the effectiveness of using AI-generated content.

As a trial, Dr Heather Meyer created an AI-generated SDA for her students on the IATL module 'Forms of Identity' (IL001/IL101). The medium chosen was a ChatGPT-generated painting (see image below), with an accompanying piece on how the painting links to the module's theme of 'Identity'. This work was then passed on to students as a pre-assessment activity to engage with the module's SDA Marking Scheme, and thus familiarise themselves with the criteria and ultimately mark and provide feedback to the piece of work they were handed. Students just assumed the SDA they were assessing was previous student work produced on the module, and when asked the mark they would have given the student using the marking scheme, all students placed the mark below a 50% - suggesting that an AI-generated SDA as such could not achieve higher than a 3rd class mark. This pre-assessment activity and AI-generated assignment trial illuminates the value of innovation in assessment design- specifically those that encourage and empower students to explore their own interests; discover their own ways of articulating and disseminating their research; and being tasked to reflect on the learning itself, as opposed to quickly producing an output.

For more information, please see [IATL's approach to Assessment](#)

Chapter 3.5 Using GenAI to support student learning differently to how you would have done this in the past

Chapter 3.5.1: Using AI for Formative Feedback: Current Challenges, Reflections, and Future Investigation

By Matthew Voice, Applied Linguistics at the University of Warwick

One strand of the WIHEA's working group for AI in education has focused on the role of AI in formative feedback. As part of this strand, I have been experimenting with feeding my own writing to a range of generative AI (ChatGPT, Google Bard, and Microsoft Bing), to learn more about the sorts of feedback they provide. The accompanying presentation documents my observations during this process. Some issues, such as the propensity of AI to 'hallucinate' sources, are well-documented concerns with current models. As discourse on student use of AI begins to make its way into the classroom, these challenges might provide a basis for critical discussion around the accuracy and quality of the feedback produced by language models, and the need for student to review any outputs produced by LLMs. Other common issues present different challenges for students using LLMs to elicit formative feedback. For instance, the prompt protocol in the presentation revealed a tendency for AI to provide contradictory advice when its suggestions are queried, leading to a confusing stance on whether or not an issue raised actually constitutes a point for improvement within the source text. When tasked with rewriting prompt material for improvement, LLMs consistently misconstrued (and therefore left absent) some of the nuances of my original review, in a fashion which changed key elements of the original argumentation without acknowledgement. The potential challenges for student users which arise from these tendencies is discussed in more detail in the presentation's notes.

In addition to giving some indication of the potential role of LLMs in formative feedback, this task has also prompted me to reflect on the way I approach and understand generative AI as an educator. Going forward, I want to suggest two points of reflection for future tasks used to generate and model LLM output in pedagogical contexts. Firstly: is the task a **reasonable** one? Using LLMs ethically requires using my own writing as a basis for prompt material, but my choice to use published work means that the text in question had already been re-drafted and edited to a publishable standard. What improvements were the LLMs supposed to find, at this point? In future, I would be interested to try eliciting LLM feedback on work in progress as a point of comparison. Secondly, is the task **realistic**, i.e., does it accurately reflect the way students use and engage with AI independently? The review in my presentation, for example, presupposes

that the process of prompting an LLM for improvements to pre-written text is comparable to student use of these programmes. But how accurate is this assumption? In the Department of Applied Linguistics, our in-progress Univoice project sees student researchers interviewing their peers about their academic process. Data from this project might provide clearer insight into the ways students employ AI in their learning and writing, providing a stronger basis for future critical investigation of the strengths and limitations in AI's capacity as a tool for feedback. Also see here: https://blogs.warwick.ac.uk/wjett/entry/using_ai_for/

Chapter 3.5.2: Have you asked your bot to make you a table? ChatGPT as a cognitive scaffolding engine

By Dominik Lukeš, Assistive Technology Officer at the University of Oxford



'Cognitive scaffolding': Image created by Dominik Lukeš using Midjourney

Preface

To illustrate the points made here, I pasted a draft of this contribution into ChatGPT (using ChatGPT Plus) and asked it to create some tables to aid in comprehension. You can follow along on the ChatGPT shared link or even continue the conversation. Don't miss out on the limerick summary at the end.

From prose to structure and vice versa

Almost all academic communication happens in prose. Long, dense stretches of text. Deep and involved discourse. As a result, almost all of the discussion about ChatGPT is about whether it can write essays, create sentences or write a summary. While the new generative AI tools can do all of those things, they are perhaps the least useful things you can ask your bot friend to do for you.

That is because while we are used to communicating our knowledge through prose, it is not necessarily how it is structured in our head and it is definitely not always the best way to acquire it. That is why we make structured notes, draw connections, look at graphical representations, mind maps, outlines, flow charts, etc.

Unfortunately, the chatbot interface of the new AI tools, while incredibly empowering, also puts us in a discursive mode and this leads us to ask prose like questions. Which is why many people do not even realise that you can ask ChatGPT to make you a table.

Tables, lists and graphs are incredibly useful for structuring knowledge but they are time-consuming to make. Which is why people make them less than they should for themselves and educators make them less than they should for others.

This is why I always start my prompt engineering sessions with the mantra "ask for structure, not prose". One of the most transformative moments people I work with experience is when I show them how ChatGPT can make tables.

Three vignettes in table making

Here three vignettes of experiences with table making.

Vignette 1: The text navigator

I was recently on a panel about AI and inclusion. I showed the audience a single example of how ChatGPT can create a table to point out key structural elements in a prose text. Before the online session was over, one of the participants posted a blog post entitled [Using ChatGPT to support neurodivergent reading and comprehension](#).

Identify all authors in this text, put them in table and add content to each cell based on the following headings: authors; title of text; key points raised in this article [then pasted in the text from my article]

this is the output:

Authors	Title of Text	Key Points Raised in This Article
Compton (2023)	N/A	Critiques the traditional examination system, citing issues of scalability and pedagogical incompatibility. The pandemic has prompted the consideration of alternative assessment methods, however there's a renewed call for traditional exams since campuses have reopened.
Williams and Wong (2009)	The efficacy of final examinations: A comparative study of closed-book, invigilated exams and open-book, open-web exams	Closed book exams are deemed outdated in the context of a knowledge economy and counterproductive to constructive learning theories that promote deep learning. Open book exams, which reduce pressure on memorization, provide less opportunities and temptations for academic dishonesty.
Lawrence & Day (2021)	How do we navigate the brave new world of online exams?	Argues that tradition and convenience often inform the continued use of traditional exams. These exams could lead to reduced marking time when feedback is not required.

His conclusion: "this would have been a complete game changer when I was a student, especially when conducting literature reviews."

Vignette 2: The empowered language teacher

A colleague teaching a foreign language was very sceptical of ChatGPT after trying it at first. She didn't like the fact that she couldn't trust it to produce reliable information and text to suit her needs exactly. But showing her tables transformed her views of it. Recently, she recounted a personal tutorial with a student who was struggling to get a particular grammatical point. So she asked ChatGPT to make a table. It contained errors (ChatGPT is fairly weak on metalanguage) but it chose good examples and the few errors took a minute to fix. But her conclusion: "I don't think I would have made the table otherwise." All language teachers (including myself) have made tables for their students, but they are time-

consuming to make and it is mentally demanding to come up with good examples. ChatGPT can reduce the process it takes to create such a table and a skilled person can see problems at a glance and fix them without much effort. And a student who approaches such a table as something to fix rather than an answer to a problem can also benefit.

Vignette 3: The missing support muscle

I was talking with a colleague about accessibility and she was asking for a quick guide on how to learn a screen reader for someone who just wants to understand a bit more. I have long been looking for such a guide but could not find one. I was planning to make one myself but could never find the time.

After we hung up, on whim, I asked ChatGPT to help me get started. The first answer was quite generic. But when I asked it to elaborate with a list of specifics, it gave me just what I wanted. Not only did I have well-structured and formatted guide but I could also ask for a suggested self-study curriculum over the course of 6 half hour sessions. And, of course, to help me self-study, I asked to get a summary of the things I had to remember in a table of keyboard shortcuts.

The lesson here is that even a skilled ChatGPT user who promotes its use to others, does not often think use its powers to help themselves and others. We are so early on in our journey, that we don't just have to learn how ChatGPT work but also how we can work with it at our side. It is not enough just to **learn that** it exists, or **learn how** to use it. We also have to **learn to** think to use it at the appropriate time. Just like we now have something akin to muscle memory to helps open a new email or a start a spreadsheet without a second thought, we have to develop a **new ChatGPT muscle** that we can deploy with enough fluency to help us achieve what we do in such a way that it does not slow us down.

Start up your cognitive scaffolding engine

There are many implicit metaphors for ChatGPT people rely on in their interactions with it. They treat it as a conversational partner, a question answering engine, an editor, essay writer, or sometimes even a friend. But the metaphor I like to encourage is to treat ChatGPT as a cognitive scaffolding engine. A tool that can help you find structures in an unstructured world. Not answers or condensed understanding but handholds that can help you bootstrap yourself as you find your own answers and develop a personal understanding. Here are three simple ways to get started.

Structured lists

When you're embarking on a new learning journey or just want to improve your understanding, ask for a list. It could be a list of key concepts, people, events. But do not stop there. Ask ChatGPT to expand the list either just more or for a specific reason. But long lists are not that helpful. Ask it to categorise the list and if you don't like the categories, ask it for a different list.

You can ask it to break categories into subcategories and explain why they belong together. Don't be afraid to question and challenge those explanations. If the list is too long or verbose, ask it to bold keywords. Anything to help you deal with the cognitive load.

Don't forget to ask to:

- ▶ Make a list of X key concepts
- ▶ Break the list into subcategories by
- ▶ Divide a subcategory further
- ▶ Explain why some things belong to that subcategory
- ▶ Bold keywords

But all the while you must keep in mind that the reason for doing that is not to create an accurate list of categories, it is to help you develop maps of meaning in your head that will help you deal better with complex situations. Any errors you find in what ChatGPT produces are just more opportunities to learn. ChatGPT is not building your house of knowledge, you are. But ChatGPT is a great helper in building the scaffolding your house gets ever taller.

Also, don't think of ChatGPT as the only tool. You can then take your lists and outlines and paste them into a mind mapping or concept mapping tool to see them more visually.

Table synopticon

Structured lists and outlines are a great way to help us think but they are very limited in how much information they can contain before they just become more prose. Enter tables. Tables let you see things side by side, fill in gaps and realise relationships.

ChatGPT is great at tables (even though it may occasionally claim not to be able to make them). Simply ask what you want in that table, specify which columns and what should be in them. You can even ask for formatting such as making the first column bold. And if you don't like something, ask it to make it again. You can ask for table directly, you can ask for a table to summarise key points in a text or to transform a list you'd made in the previous steps.

Here are some example prompts you can use:

- ▶ Make a table of keyboard shortcuts to use with a screen reader. [Here ChatGPT will probably guess correctly which columns it should use but you can also specify them].
- ▶ Make a table of the concepts in the list you made with 4 columns. 1: concept/term, 2: definition, 3: category, 4: related terms.
- ▶ Make a table of key people mentioned in this text. Columns 1: Name, 2: title, 3: job, 4: why they were mentioned.

Again, these tables are there not to replace the thinking you have to do, they are there to help you guide it. Expect errors, missing data or even complete hallucinations. But spotting and correcting those, is part of the learning process.

Also, the context window is important. The free version of ChatGPT (version 3.5) can only handle short contexts (about 1,000 words), the paid ChatGPT Plus can deal with texts upto about 2-3,000 words. Some tools with longer context windows exist but the more text you put in, the less reliable they become.

Priming engine

But ChatGPT cannot just help you with existing texts or known areas. It can also help you get started. Get over the terror of the blank page or reduce the panic people experience while trying to take notes on a new subject.

Asking for suggested wording, outlines to write about or a list of suggestions is the obvious answer. But you can also reach for the unexpected. One suggestion I learned from a medical student is to use ChatGPT to write poems and mnemonics with key terms to aid memorisation. But you can also use it to develop a sense of comfort with a new area. Simply paste the title of a lecture you're going to and ask ChatGPT to write a limerick or a short dramatic story about. All of a sudden, the new will not be so new. You will not be trying to build structures in your brain but instead preparing the ground to start the building process.

Welcome to the cognitive revolution

ChatGPT does not stand alone. It has inspired hundreds of makers to create interesting tools using the underlying language model or its competitors. To bring many of the conversations together, a new podcast appeared in March 2023 entitled [Cognitive Revolution](#). This is not a podcast dealing just with questions of education, but its title and many of the topics discussed could not be more relevant. Of the many transformations ChatGPT and its generative AI brethren are supposed to usher, cognitive revolution is perhaps the most exciting. Thinking in these terms can help educators and students reorient their thinking about this tool to truly support their learning rather than simply as a tool to shortcut some of the hard work our brains still have to do.

Finally, here again the thread mentioned in the preface, illustrating how the cognitive scaffolding can work: <https://chat.openai.com/share/58331dc3-8c6f-49f3-9388-b08655a15548> Including a limerick:

In AI's mysterious digital town,
ChatGPT wears a cognitive crown.
It structures our thoughts,
Fights blank-page fraught,
And lessens the academic frown!

Chapter 3.6: Building our own GenAI Tools

Chapter 3.6.1: Using an LLM as a Fintech Research Tool

Using published, peer-reviewed research from WBS Gillmore Centre researchers to disseminate knowledge in Financial Technology to a wide audience.

By Matt Hanmer, Gillmore Centre for Financial Technology

Summary of Report and Themes

Researchers at the Gillmore Centre for Financial Technology based at WBS have used an open-source Large Language Model ('LLM') to create a 'Chat GPT-like' tool focussing on Fintech. The collective published research from all researchers associated with the Gillmore Centre was used to ensure answers from the tool were sourced from peer-reviewed papers and conference speeches providing the user high confidence in the answers.

Introduction

Gillmore Centre researchers worked on the hypothesis that the majority of information on the internet relating to 'Fintech' was driven by companies promoting their own solutions and products. The veracity of this information could not be assured and as such would create frequent 'hallucinations' if Chat GPT were used to enquire about Fintech topics. Although there would also be valid responses the tool was unsuitable for research purposes.

Review by key themes

Theme 1: Ensuring Academic Integrity in Generative AI Responses

To test our hypothesis researchers presented Chat GPT with a number of simple questions about the field of Fintech to examine the type of answers that the tool provided. Many answers were reliable and contained credible citations. However, even where credible citations were present Chat GPT has a tendency to also cite publications and articles from the internet whose provenance was less clear and reliable. As such it was concluded that answers might be influenced by commercial motives and therefore detracting from understanding subjects in Fintech.

Theme 2: Creating a Data-set Wide Enough to Make the Model Cogent

We used an Open Source LLM of which there are a number available. This allowed us to have no licence challenges with Open AI. To train and feed the model we had to create a database of verified research articles specific to the main pillars of Fintech: Digital Economy, Artificial Intelligence & Innovation. We targeted x40 WBS & Warwick academics that are aligned to the Gillmore Centre & created a database of all their articles and conference speeches. In the early beta model, we had to re-train the model to make sure there was relevant research to answer the question. We used prompts for common questions to aid the CX.

Theme 3: Building the Research Network

We are building the next stage of the database by including more academics that have worked with the Gillmore Centre and therefore increasing the research available for the LLM. We maintain quality by only including peer-reviewed papers, or where presentations have been made at academic conferences. This maintains integrity in the source.

Recommendations

- ▶ Begin the project with a general hypothesis
- ▶ Start to create and train the LLM with a relatively small amount of data
- ▶ Maintain quality and integrity in the data at all times
- ▶ Understand your vision for the product

Conclusions

At the Gillmore Centre, we believe that although there is considerable attention being paid to internet based generative AI models like Chat GPT, Bing etc. the next phase of development in this area will be more discrete and focused on models that maintain integrity in the source of their information. The Gillmore Centre is aiming to build this model for Fintech.

Chapter 3.6.2: Instructions and requirements for developing AI chatbot reading list applications

By Ashkan Eshghi, Postdoc Information Systems and Management, WBS

Introduction

Similar to the tool outlined in chapter 3.6.1, the following outline aims to start considering how to build apps that use generative AI to enhance students' learning experience by allowing them to interact with course materials and reading lists. The first app acts as an advanced search engine, providing relevant information by using document embeddings and semantic search. The second app utilises a Large Language Model such as OpenAI GPT, Llama, Bloom, etc., to generate comprehensive responses to user queries from the course materials and reading list.

App 1: Reading List - Semantic Search Engine

Step 1: Preparing Data

- 1. Collect Data:** Gather reading list PDFs and other materials along with relevant information like authors' names, published dates, publishers, etc. Convert all documents to text files.
- 2. Pre-process Data:** Remove noise and unnecessary information while splitting the documents into smaller text chunks.
- 3. Create Embeddings:** Utilise an embedding model to generate vector representations (embeddings) for the documents in the database, capturing the meaning of the text.
- 4. Create a Vector Database:** Use an indexing tool (e.g., FAISS) to build a Vector Database containing text embeddings and their corresponding metadata.

Step 2: Semantic Search

- 1. Embed User Query:** When a user submits a query, create an embedding for the query using the same method as the document embeddings.
- 2. Compare and Rank:** Employ cosine similarity to compare the query vector with the document vectors stored in the Vector Database.
- 3. Retrieve Relevant Documents:** Identify and retrieve documents with the highest similarity scores, ranking documents based on proximity in the high-dimensional space.

Step 3: Provide Relevant Information

Select the most relevant document and present the relevant chunk of text and its metadata as search results.

Step 4: Implement a User Interface

Design and implement an intuitive user interface, allowing students to interact with the app.

Step 5: Deploy the App

Deploy the app as a widget or webpage in a live environment (requires access to a server).

App 2: Reading List - Question Answering AI

Step 1-2: Same as Semantic Search Engine

Step 3: Generating Answer

- 1. Select a Large Language Model (LLM):** Choose an appropriate LLM for question answering, such as OpenAI GPT (requires OpenAI API access) or an open-source LLMs (requires a powerful GPU).
- 2. Design Prompt:** Generate a prompt combining user query and the retrieved relevant chunk of information (from Step 2) as the input for LLM.
- 3. Generate Answer:** Utilise the chosen LLM to generate comprehensive answers to user queries based on the retrieved documents.

Step 4-5: Same as Semantic Search Engine

(Note: In the case of using an open-source LLM, the server's virtual machine needs to be equipped with a powerful GPU.)

Recommendations and Conclusion



DALL-E 2, 2023j

Recommendations

The report makes the following Warwick-specific recommendations:

Short-term, to be developed this summer

1. Centralised guidance for staff and students on appropriate and effective use of AI from Freshers' week 2023/24 onwards, including clear policies on academic integrity (in approval stage).
2. Central communication strategy, including an end of term statement from Senior Leadership confirming the following:
 - a. Alignment with the [Russell Group Principles on the use of generative AI tools in education](#).
 - b. Policies are being implemented at institutional level to uphold academic integrity.
 - c. Currently, there is no requirement to find consensus on whether *at individual module level* or *at department level* the use of AI for teaching and assessments is embraced or avoided.
 - d. In line with other Russell group universities the University will support students and staff to become AI-literate.
 - e. For comprehensive guidance on the use of AI in teaching and assessments colleagues are encouraged to review this report and visit the ADC webpages.

Medium-term, to be commenced at the start of academic year 2023/24

3. Create an interdisciplinary expert group, spanning education, research, professional services (especially FOLD and IDG) to conceptualise a potential digital transformation vision, strategy and approach for Warwick, incorporating an emphasis on Warwick's current strategic priorities such as Inclusion and Sustainability.
4. Create an additional Academic Director *Digital* role with a fractional workload allocation that provides expert and informed academic leadership in this area, reviewing the opportunities and risk of digital transformation at Warwick. This role should be an academic appointment with relevant expertise in the area of digital innovation and transformation and should complement current remits around academic integrity.
5. Maintain rigour and academic excellence in high-stakes environments, while starting to build a culture of digital innovation in low-stakes environments:
 - a. Students and staff should be encouraged to propose innovative ideas centrally in regular 'drop-ins' with members of the expert group (recommendation 3) that can operate with shorter turn-around times than the formal committee and student consultation processes.
 - b. Introduce agile approaches so that scalable low-stakes and low-cost ideas can be developed and trialled outside the existing secure IT systems, building on cloud technology and sandboxing techniques.
 - c. Capture and showcase different departments' deployment of innovative education and novel technology to raise the visibility of digital innovation in education, student experience, and research, with findings feeding into existing centrally administrated social media and webpage design.

- d. Strengthen existing partnerships in the area of digital transformation and AI (such as the Monash alliance) and review potential new partnerships with other institutions and businesses on digital transformation and AI in education.
6. Continue the ongoing work to develop a suite of resources and guidance to inform, upskill and facilitate general and discipline-specific exploration. Academic integrity policies to be regularly reviewed and adapted to ensure fairness between modules and courses, independent of mode of assessment. ADC to build on their existing expertise to support programme level design to promote inclusive assessment, assessment innovation, and to advise on cohesion at programme level across faculties.

The long-term digital strategy should be informed by the findings of the expert group (recommendation 3) and should inform the education, research and digital information strategies.

Conclusion

The aim of our discussions of the past six months and this summary report was to shed light on the critical role of AI in education and to provide valuable insights for its implementation. The research findings underscore the need to embrace AI in education, recognising its significance in the workplace and wider society. However, it is crucial to emphasise a holistic approach to education, where AI serves as a complement to active engagement and independent thinking rather than a replacement for human intelligence.

One of the main recommendations is to create an environment at Warwick (and across the sector) that fosters critical thinking and problem-solving alongside AI utilisation. This recognises that AI is not infallible and highlights the importance of developing students' skills in conjunction with AI. Moreover, the access to information generated by AI can bridge barriers and enhance understanding, promoting inclusive learning environments.

Another crucial aspect is the integration of AI education and the provision of support for ethical considerations. Students' AI literacy should be developed, and ethical guidelines should be established to ensure responsible use of AI technologies. By prioritising practical experience and lifelong learning, students can be better prepared for the evolving job market, where AI will be widely utilised.

The Task and Finish Group's findings provide specific insights into different areas of AI implementation in education. The discussions on the AI-enhanced learning environment highlight concerns about educational inequality and emphasise the need for investment in building capacity and capability to ensure all students and staff can actively participate in shaping the future AI landscape.

The chapter on teaching of the future explored the potential use of AI tools by educators and students, recognising AI as a collaborative partner. It emphasised the need to identify key touchpoints where AI tools can serve as co-pilots, enhancing the teaching and learning experience.

The discussions on academic integrity and AI ethics underscored the importance of protecting academic integrity while leveraging AI's potential to support various aspects of the learning process. Transparent guidelines and support systems should be established to foster collaboration between educators and learners, preparing students to use AI confidently and responsibly.

The chapter on designing assessments highlighted the need for assessments to consider the learning journey, incorporating authentic assessments that maintain validity and integrity while harnessing the power of technologies, including AI. It emphasised the importance of promoting AI literacy and ensuring that AI is integrated into assessments only when it enhances the pedagogical process.

The use of AI in providing feedback through dialoguing with AI was discussed in the chapter on dialogue and feedback. The group reflected on the current challenges and explored the opportunities and risks associated with AI. Recommendations were made to improve the marking and feedback process, including the sharing of useful resources and exploring ways in which AI can be effectively deployed to improve marking and feedback.

Lastly, the chapter on technical thoughts and further considerations emphasised the need for a holistic digital transformation journey in education to retain a competitive edge. It highlighted the current constraints and limitations of developing in-house AI-based innovations and the need for support and investment at a university level in order to encourage and develop in-house initiatives. The report gives concrete suggestions and pointers as to how the university might take this work forward, as well as providing practical examples of AI initiatives that have already been adopted and trialled in different areas across the university.

Overall, the findings from the student perspective and the Task and Finish Group provide a comprehensive understanding of the application of AI in education. The insights and recommendations underscore the importance of embracing AI while maintaining a focus on holistic education, critical thinking, ethical considerations, and inclusivity. By leveraging AI effectively, Warwick University can enhance student engagement, personalise learning experiences, aid administrative tasks, and facilitate research activities.

The Task and Finish Group's strong recommendation is for the university to now draw all of this good work together by providing the necessary strategic leadership coordination and the necessary investment in both human and IT resources. The full list of recommendations included ideas about how, with the advent of AI, the use of technology within a working community needs to be fundamentally re-envisaged (Callen et al. 2023). In taking these recommendations forward, the university will be in the best possible position to respond nimbly and effectively to the unfolding AI revolution and its impact upon higher education. In addition, Warwick University will be positioning itself at the vanguard of responsible AI development and thereby providing an extremely valuable service to education and wider society more generally.

Contributors, Prompts and References

Biographies of some of the contributors

Please note: As we worked in strands with different themes, different aspects of the report might not necessarily represent the opinion of all contributors.

The list of contributors is not exhaustive, the task and finish group had members who actively participated in the meetings but not in the report writing. Other colleagues contributed to the report, however, chose not to share their photo and biography.

Contributors are listed in **alphabetical order by last name**.



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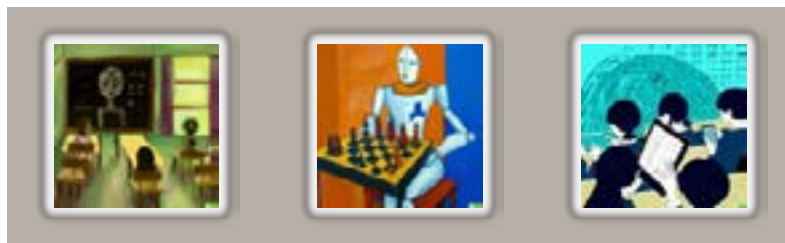


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Prompts used to generate DALL-E 2 images



Images generated by DALL-E 2, prompts below

DALL-E 2, 2023a: DALL-E 2 response generated on 21 May 2023, retrieved from Open AI's DALL-E 2 <http://labs.openai.com> using the following prompt; 'A painting of artificial intelligence in the classroom.'

[DALL-E 2, 2023b: DALL-E 2 response generated on 21 May 2023, retrieved from Open AI's DALL-E 2 <http://labs.openai.com> using the following prompt; 'Student conquering AI in a university illustration'] - not shown in the image above, see [chapter 1.1](#) instead.

DALL-E 2, 2023c: DALL-E 2 response generated on 21 May 2023, retrieved from Open AI's DALL-E 2 <http://labs.openai.com> using the following prompt; 'An oil painting by Matisse of a humanoid robot playing chess.'

DALL-E 2, 2023d: DALL-E 2 response generated on 21 May 2023, retrieved from Open AI's DALL-E 2 <http://labs.openai.com> using the following prompt; 'University mortar board and scales of justice in Picasso Cubist style.'

DALL-E 2, 2023e: DALL-E 2 response generated on 21 May 2023, retrieved from Open AI's DALL-E 2 <http://labs.openai.com> using the following prompt; 'Students in an examination hall in the style of Edvard Munch.'

DALL-E 2, 2023f: DALL-E 2 response generated on 21 May 2023, retrieved from Open AI's DALL-E 2 <http://labs.openai.com> using the following prompt; 'Painting of students in a classroom of the future in the Bauhaus style.'

DALL-E 2, 2023g: DALL-E 2 response generated on 24 May 2023, retrieved from Open AI's DALL-E 2 <http://labs.openai.com> using the following prompt; 'Painting of students in educational dialogue in the style of Faith Ringgold.'

DALL-E 2, 2023h: DALL-E 2 response generated on 23 May 2023, retrieved from Open AI's DALL-E 2 <http://labs.openai.com> using the following prompt; 'A painting of students using AI in the classroom in the style of Julie Mehretu.'

DALL-E 2, 2023i: DALL-E 2 response generated on 21 May 2023, retrieved from Open AI's DALL-E 2 <http://labs.openai.com> using the following prompt; 'A picture of students using AI in the classroom in the style of Hokusai.'

DALL-E 2, 2023j: DALL-E 2 response generated on 25 May 2023, retrieved from Open AI's DALL-E 2 <http://labs.openai.com> using the following prompt; 'A question mark about what next in AI in the style of Roy Lichtenstein.'

As readers will hopefully see, we used a mixture of gender, race and nationalities as artist prompts for Open AI's image generation tool DALL-E 2. We leave it to the reader to decide if the output is equally balanced.

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Useful links from Chapter 2.3

ChatGPT for Educators <https://bron-eager.thinkific.com/courses/ChatGPT-getting-started>

Council of Europe 2022. AI and Education: A critical view through the lens of human rights, democracy and the rule of law <https://rm.coe.int/artificial-intelligence-and-education-a-critical-view-through-the-lens/1680a886bd>

Ethical guidelines on the use of artificial intelligence (AI) and data in teaching and learning for educators <https://op.europa.eu/en/publication-detail/-/publication/d81a0d54-5348-11ed-92ed-01aa75ed71a1/language-en>

Examples of what AI tools can do in supporting students <https://platform.openai.com/examples>
New AI classifier for indicating AI written text <https://openai.com/blog/new-ai-classifier-for-indicating-ai-written-text>

Floridi, 2023, *Philosophy and Technology* https://papers.ssrn.com/sol3/papers.cfm?abstract_id=4358789

Proofreading Policy ([Proofreading Policy - Education Policy and Quality Team \(warwick.ac.uk\)](#))
QAA Webinar series on ChatGPT <https://www.qaa.ac.uk/en/membership/membership-areas-of-work/academic-integrity/chatgpt-and-artificial-intelligence>

Regulation 11 and its attendant guidance ([Reg. 11 Academic Integrity \(from 4 Oct 2021\) \(warwick.ac.uk\)](#)); and
Susarla, Gopal, Thatcher and Sarker, 2023, *Information Systems Research* <https://pubsonline.informs.org/doi/epdf/10.1287/isre.2023.ed.v34.n2>

The Institute for Ethical AI in Education: Ethical Framework for AI Education <https://www.buckingham.ac.uk/wp-content/uploads/2021/03/The-Institute-for-Ethical-AI-in-Education-The-Ethical-Framework-for-AI-in-Education.pdf> The University of Buckingham.

UNESCO 2021 guidance for policymakers. AI and Education: <https://unesdoc.unesco.org/ark:/48223/pf0000376709>

Wayne Holmes Keynote Speech at EDULEARN 2022
<https://www.youtube.com/watch?v=fvbx-Cdd90I>

Suggested reading for further reading from Chapter 2.4

Principles of assessment design (ADC), including [guidance on designing assessment that supports the use of AI](#) from the 'AI in Education' subgroup of the WIHEA Diverse Assessment Learning.

QAA code, advice and guidance: Assessment (2018) [advice-and-guidance-assessment.pdf \(qaa.ac.uk\)](#)

QAA webinars:

ChatGPT: [How to use it as a force for good?](#)

ChatGPT: [What should assessment look like now?](#)

Rudolph, J., Tan, S., & Tan, S. (2023) ChatGPT: Bullshit spewer or the end of traditional assessments in higher education? *Journal of Applied Learning and Teaching*, 6(1). <https://doi.org/10.37074/jalt.2023.6.1.9>

Suggested reading for further reading from Chapter 3.6

Gillmore Centre - <https://www.wbs.ac.uk/research/research-centres-and-networks/gillmore-centre-financial-technology/>

GillmoreAI - <http://13.42.48.4:8501/>

Gillmore Events - <https://warwick.ac.uk/fac/soc/wbs/subjects/finance/gillmore/>

Some of the blogs published as part of this WIHEA Learning Circle

Blog 1: **Launch** of the learning circle (Isabel Fischer & Leda Mirbahai):
https://blogs.warwick.ac.uk/wjett/entry/interested_in_diverse/

Blog 2: *Creative projects and the 'state of play' in diverse assessments* (Lewis Beer): https://blogs.warwick.ac.uk/wjett/entry/creative_projects_and/

Blog 3: *Student experience of assessments* (Molly Fowler):
https://blogs.warwick.ac.uk/wjett/entry/a_student_perspective/

Blog 4: *Assessment Strategy - one year after starting the learning circle* (Isabel Fischer & Leda Mirbahai):
https://blogs.warwick.ac.uk/wjett/entry/one_year_on/

Blog 5: *Learnings and suggestions based on implementing diverse assessments in the foundation year at Warwick* (Lucy Ryland): https://blogs.warwick.ac.uk/wjett/entry/learnings_suggestions_based/

Blog 6: How inclusive is your assessment strategy? (Leda Mirbahai):
https://blogs.warwick.ac.uk/wjett/entry/blog_6_how/

Blog 7: Democratising the feedback process (Linda Enow):
https://blogs.warwick.ac.uk/wjett/entry/democratising_the_feedback/

Blog 8: AI for Good: Evaluating and Shaping Opportunities of AI in Education (Isabel Fischer, Leda Mirbahai & David Buxton):
https://blogs.warwick.ac.uk/wjett/entry/ai_for_good/

Blog 9: On 'Opportunities of AI in Higher Education' by DALL.E and ChatGPT (Isabel Fischer):
https://blogs.warwick.ac.uk/wjett/entry/on_opportunities_of/

Blog 10: Pedagogic paradigm 4.0: bringing students, educators and AI together (Isabel Fischer):
<https://www.timeshighereducation.com/campus/pedagogic-paradigm-40-bringing-students-educators-and-ai-together>

Blog 11: Ethically deploying AI in education: An update from the University of Warwick's open community of practice (Isabel Fischer, Leda Mirbahai, Lewis Beer, David Buxton, Sam Grierson, Lee Griffin, and Neha Gupta):
<https://www.open.ac.uk/scholarship-and-innovation/scilab/ethically-deploying-ai-education>

References from the University of Warwick's Principles Governing the Appropriate and Ethical Use of Online Assessment Data

B.Custers (2016) Click here to consent forever: expiry dates for informed consent. *Big Data & Society*, 3(1), 1-6, <https://doi.org/10.1177/2053951715624935>

K.M.L. Jones (2019) Learning analytics and higher education: a proposed model for establishing informed consent mechanisms to promote student privacy and autonomy. *International Journal of Educational Technology in Higher Education*, 16(24), <https://doi.org/10.1186/s41239-019-0155-0>

E.B. Mandinach and J.B. Jimerson (2021) Data ethics in education: a theoretical, practical and policy issue. *Studia Paedagogica*, 26(4), <https://doi.org/10.5817/SP2021-4-1>

A. Skene, L. Winer and E. Kustra (2022) Clouds in the silver lining of learning analytics: ethical tensions for Educational Developers. *International Journal for Academic Development*, DOI: [10.1080/1360144X.2022.2099208](https://doi.org/10.1080/1360144X.2022.2099208)

L. Slusky (2020) Cybersecurity of Online Proctoring Systems. *Journal of International Technology and Information Management*, 29(1), article 3, <https://scholarworks.lib.csusb.edu/jitim/vol29/iss1/3>

J. Young, T.J. Smith and S.H. Zheng (2020) Call me BIG PAPA: an extension of Mason's information ethics framework to big data. *Journal for the Midwest Association for Information Systems*, 2020(2), article 3, DOI: [10.17705/3jmwa.000059](https://doi.org/10.17705/3jmwa.000059)

Reference from the Conclusion

Callen Anthony, Beth A. Bechky, Anne-Laure Fayard (2023) "Collaborating" with AI: Taking a System View to Explore the Future of Work. *Organization Science*. <https://pubsonline.informs.org/doi/abs/10.1287/orsc.2022.1651?journalCode=orsc>

Appendix 3: AI and safeguarding Academic Integrity

Suggested wording on The use of Artificial Intelligence (AI)

The University recognises an increasing number of technologies such as Artificial Intelligence and that they may be applicable in your completing this assessment. The Assessment Brief sets out specific requirements or restrictions, and your student handbook and general guidance [LINK] has further guidance and advice.

You are reminded that the inappropriate use of such a technology may constitute a breach of University policy, such as the Proofreading Policy or Regulation 11 (Academic Integrity). If you breach these policies it may have significant consequences for your studies. Please make sure you read and understand the assessment brief and how AI may or may not be used.

If a generative AI or similar has been used you MUST make clear why you used such a tool or service, what you used it for and you will be obliged to confirm that you take sole [joint if a group submission] intellectual ownership of any submitted work.

You are advised to keep good records such as screenshots of any interactions you have with generative AI in case you are requested to explain further how it was used.

When you submit you must complete and sign (physically or electronically) a declaration. You can read the full text here [LINK]. This requires you to explain the use of any AI. Failure to disclose at the point of submission may be prejudicial in any later investigations should they arise.

Suggested assignment briefing text where student AI-use forms part of the assessment

This wording is suggested, any appropriate wording that gives sufficient clarity is equally valid. It is expected that such assessments would contain specific directions on the tool's use and how it should be presented. That may render separate wording redundant.

In this assessment you will need to use [AI Tool/Service] as instructed.

You MUST set out clearly [in the body of the answer/in an appendix] how you used the tool/service and you SHOULD keep good records such as screen captures for later reference in case you are called for a viva or other enquiries.

You MUST set out clearly what output from the tool/service has been included, and where you have altered, adopted or built on that output.

Assessment briefs must make it clear if a specific tool or service is to be used, or if a student can choose. If certain tools are not permissible, such as a paid-for service, that must be made clear in the assessment brief, such as

You MUST NOT use any tool or service requiring any subscription; or

You MUST select from the following: [LIST]

Clear consequences of not abiding by the instructions should be set out, such as a zero grade, mark cap, mark reduction etc and how such would work.

Suggested wording for the prohibition on the use of AI

This wording is suggested, any appropriate wording that gives sufficient clarity is equally valid.

You MUST NOT use any generative Artificial Intelligence in this assessment unless specifically authorised for reasonable adjustments. You MAY use non-generative tools such as a spell-check, basic grammar check (non-generative), calculator or similar. If you have any doubts about a tool or service you plan to use please contact the tutor.

OR

You MUST NOT use any form of Artificial Intelligence in this assessment unless specifically authorised for reasonable adjustments. This includes non-generative AI such as spell-checks, grammar checks or calculators. If you have any doubts about a tool or service you plan to use please contact the tutor.

OR

You MUST NOT use any form of Artificial Intelligence in this assessment unless specifically authorised for reasonable adjustments. You may use any or all of the following tools/services [LIST]. No other tools or services are permitted.

Clear consequences of not abiding by the instructions should be set out, such as a zero grade, mark cap, mark reduction etc and how such would work.

Suggested wording for ambivalence towards the use of AI

This wording is suggested, any appropriate wording that gives sufficient clarity is equally valid.

If you use a generative Artificial Intelligence (AI) in the process of completing this assignment you MUST set out clearly before the bibliography/references [or other suitable place] the following:

- ▶ *WHY you used a generative AI*
- ▶ *WHAT it was used for*
- ▶ *Which AI was used; and*
- ▶ *If any generated content has been used directly in this submission, if so where.*

You will also have to confirm in your declaration that the work remains yours and you have intellectual ownership of it. You may be called for viva or other interview to demonstrate such intellectual ownership. A failure to disclose the use of AI, or the use of a misleading description of its use may have significant consequences for your studies. As a result keeping good records of your interactions is strongly advised.

Forum for Assessment

This is at a tutor's discretion, it is naturally easier to exclude the use of any tool or service under specific controlled conditions, again clarity of expectation and potential sanctions must be given to avoid confusion.

Submission

At the point of submission students must complete and sign either in wet ink or via 'click-wrap' a declaration concerning their submission.

The text of that submission from [DATE] is below. Students should be made aware of this requirement

and encouraged to read and understand it *before* they submit any work. It would not help a student to claim they signed without reading the declaration.

Text for submissions

Updated text for submissions, physical submissions should use a printed version the student can sign, online submissions will require a click-wrap style confirmation.

Academic Integrity Declaration

We're part of an academic community at Warwick. Whether studying, teaching, or researching, we're all taking part in an expert conversation which must meet standards of academic integrity. When we all meet these standards, we can take pride in our own academic achievements, as individuals and as an academic community.

Academic integrity means committing to honesty in academic work, giving credit where we've used others' ideas and being proud of our own achievements.

In submitting my work I confirm that:

- 1. I have read the guidance on academic integrity provided in the Student Handbook and understand the University regulations in relation to Academic Integrity. I am aware of the potential consequences of Academic Misconduct.*
- 2. I declare that the work is all my own, except where I have stated otherwise.*
- 3. No substantial part(s) of the work submitted here has also been submitted by me in other credit bearing assessments courses of study (other than in certain cases of a resubmission of a piece of work), and I acknowledge that if this has been done this may lead to an appropriate sanction.*
- 4. Where a generative Artificial Intelligence such as ChatGPT has been used I confirm I have abided by both the University guidance and specific requirements as set out in the Student Handbook and the Assessment brief. I have clearly acknowledged the use of any generative Artificial Intelligence in my submission, my reasoning for using it and which generative AI (or AIs) I have used. Except where indicated the work is otherwise entirely my own.*
- 5. I understand that should this piece of work raise concerns requiring investigation in relation to any of points above, it is possible that other work I have submitted for assessment will be checked, even if marks (provisional or confirmed) have been published.*
- 6. Where a proofreader, paid or unpaid was used, I confirm that the proofreader was made aware of and has complied with the University's proofreading policy.*
- 7. I consent that my work may be submitted to Turnitin or other analytical technology. I understand the use of this service (or similar), along with other methods of maintaining the integrity of the academic process, will help the University uphold academic standards and assessment fairness.*

Privacy statement

The data on this form relates to your submission of coursework. The date and time of your submission, your identity, and the work you have submitted will be stored. We will only use this data to administer and record your coursework submission.

Related articles [to be hyperlinked online, or with a url or other access for physical submissions]

Reg. 11 Academic Integrity (from 4 Oct 2021) (warwick.ac.uk)

Guidance on Regulation 11 (warwick.ac.uk)

Proofreading Policy - Education Policy and Quality Team (warwick.ac.uk)

Academic Integrity (warwick.ac.uk)

Comments or suggestions?

Please provide your comments and suggestions on the report or on next steps here:

<https://forms.gle/nuWteCwhcWMguKjAA>

We look forward to hearing from you.

Thank you.

