

2023

## Prompting Higher Education Towards AI-Augmented Teaching and Learning Practice

Bronwyn Eager

University of Tasmania, Australia, [bronwyn.eager@utas.edu.au](mailto:bronwyn.eager@utas.edu.au)

Ryan Brunton

University of Tasmania, Australia, [ryan.brunton@utas.edu.au](mailto:ryan.brunton@utas.edu.au)

Follow this and additional works at: <https://ro.uow.edu.au/jutlp>

---

### Recommended Citation

Eager, B., & Brunton, R. (2023). Prompting Higher Education Towards AI-Augmented Teaching and Learning Practice. *Journal of University Teaching & Learning Practice*, 20(5). <https://doi.org/10.53761/1.20.5.02>

Research Online is the open access institutional repository for the University of Wollongong. For further information contact the UOW Library: [research-pubs@uow.edu.au](mailto:research-pubs@uow.edu.au)

---

# Prompting Higher Education Towards AI-Augmented Teaching and Learning Practice

## Abstract

Large Language Models (LLMs) and conversational-style generative artificial intelligence (AI) are causing major disruption to higher education pedagogy. The emergence of tools like ChatGPT has raised concerns about plagiarism detection but also presents opportunities for educators to leverage AI to build supportive learning environments. In this commentary, we explore the potential of AI-augmented teaching and learning practice in higher education, discussing both the productive affordances and challenges associated with these technologies. We offer instructional advice for writing instructional text to guide the generation of quality outputs from AI models, as well as a case study to illustrate using AI for assessment design. Ultimately, we suggest that AI should be seen as one tool among many that can be used to enhance teaching and learning outcomes in higher education.

## Practitioner Notes

1. Learning to write effective instructional prompts for AI models will help augment learning and teaching practice.
2. AI models offer the potential for significant productive affordances, including personalised feedback, adaptive learning pathways, and enhanced student engagement.
3. To successfully integrate AI into higher education, institutions must prioritise faculty development programs that provide training and support for educators to effectively use these technologies in the classroom.
4. Institutions must ensure that AI is used in a way that aligns with their values and mission and that students are informed about how their data is being used.
5. It is important to recognise that AI is not a panacea for all of the challenges facing higher education. Rather, it should be seen as one tool among many that can be used to enhance teaching and learning outcomes.

## Keywords

ChatGPT, artificial intelligence, large language model, assessment design, prompt engineering

## Introduction

The higher education community has been galvanised by the mainstream emergence of Artificial Intelligence (AI). Worldwide, universities are grappling with the broader implications of these technologies (Bjork, 2023), with AI threatening traditional assessment design including the demise of essays and online assessment (Cassidy, 2023). As global awareness of AI snowballs, and the availability and adoption rates of consumer-based AI tools skyrocket, universities are increasingly recognising the need for teaching and learning approaches to evolve in a manner that adapts to a shifting landscape shaped by the growing influence of AI. However, opinions on what that path forward will look like remain far from clear.

Practical responses to 'the AI situation' vary widely. On one hand, people may resist AI or deploy defensive measures. Our observations suggest that such responses originate from an initial awareness of AI tools, leading to curiosity, followed by experimentation, and finally, resistance. This trajectory may result in attempts to regulate AI usage, including outright bans on AI technologies (McCallum, 2023) and the adoption of AI-detection software. Resistance likely has origins in concerns that AI tools can produce essays, answer questions to exams, and augment student capability to achieve an advantage when completing any form of assessment task involving computer-based work (Cotton et al., 2023; Kung et al., 2023).

We recognise these concerns and acknowledge AI's potential to be used in ways that displace or misrepresent human effort. However, we believe in taking a different lens to the AI debate. We advocate for the integration of AI technologies across academia as a way of potentially improving teaching and learning practices, while ensuring the continued relevance and sustainability of higher education.

In this commentary, we draw from our roles as an academic educator and a learning developer to extend earlier discussions in this Journal. We build upon Perkins' (2023) exploration of AI's role in academic integrity and Crawford et al.'s (2023) inquiry into the ethical use of AI models. By leveraging and sharing our experiences, we seek to assist those who are aiming to create high-quality AI outputs and navigate this transformative era.

In what follows, we first discuss the importance of learning how to write effective instructional commands to optimise the usefulness of AI tools when generating teaching and learning content. The discussion is framed by an introduction to 'prompt engineering' and suggestions are provided for different approaches to writing effective prompts. We then proceed to operationalise these insights by presenting a case study with which to showcase how prompts can lead to augmenting assessment design. We conclude by noting practical considerations for guiding the high education sector towards a sustained future amidst the predictable state of operating within an AI-ubiquitous world.

### Academic Editors

Section: Curriculum and Assessment  
Editor in Chief: Dr Joseph Crawford  
Senior Editor: A/Prof Michael Cowling

### Publication

Received: 3 May 2023  
Revision: 21 May 2023  
Accepted: 23 May 2023  
Published: 29 May 2023

Copyright: © by the authors, in its year of first publication. This publication is an open access publication under the Creative Commons Attribution CC BY-ND 4.0 license.

## **Prompt Engineering**

Artificial Intelligence (AI) involves machines simulating human intelligence processes. One type of AI, known as Large Language Models (LLM), can produce text that resembles human writing. A specific application of a LLM is a 'chatbot', perhaps the most well-known being ChatGPT. However, there are many chatbots, including Google's Bard and Microsoft's Bing. These software programs work by mimicking human conversation, interacting with users primarily through text: upon receiving a text-based input, chatbots analyse the patterns in the data they've been trained on, then use these patterns to predict and generate responses. The output produced by chatbots is typically a block of text that appears as if it were written by a human.

In this Commentary, we focus on the versatile benefits of AI chatbots, as applied to educational contexts, with particular attention given to the craft of writing effective text-based inputs, known as 'prompts'. Emphasis is placed on the skill of writing prompts because prompts serve as the starting point for an AI model's text generation. Thus, the ability to effectively use AI hinges on prompt writing expertise.

The art of designing, writing, and fine-tuning prompts is termed 'prompt engineering' (Short & Short, 2023). As AI becomes increasingly prevalent, and its integration into most computer-based tasks becomes expected, the ability to guide AI models is fast becoming a critical skill for thriving in AI-enhanced work environments (Taylor et al., 2022). Consequently, the ability to write prompts is anticipated to emerge as a crucial competency for harnessing the potential of AI in augmenting teaching and learning practices.

## **How Education and Teaching Roles Might Change With AI**

AI is becoming increasingly central in its role in shaping the future of higher education (Dignum, 2021; Pavlik, 2023). Below, we note several potential implications for academic teaching staff and learning developers.

### **Academic Teaching Staff Role Evolution**

As AI assumes a greater role in content creation (e.g., building content structure and generating case studies) and management tasks (e.g., scheduling of classes), the future will likely see a shift in the roles and responsibilities of educators. With the continuous advancements in AI technology, educators will need to adapt and upskill.

Mastering the art of writing effective prompts will enable educators to collaborate effectively with AI models, resulting in increased chances for generating engaging, targeted, and pedagogically sound content (the mechanics of which are introduced below). Expertise in prompt engineering also offers promise in equipping educators with the ability to adapt AI-generated content to various learning contexts, making AI a tool with the capacity to craft diverse and captivating learning experiences. Ultimately, embracing prompt engineering will be essential for academic teaching staff to stay at the cutting edge of educational innovation and to ensure their ability to provide high-quality learning experiences for their students.

## **Evolving Roles of Learning Developers**

The role of learning developers may evolve to ensure the effective implementation of AI-generated content within academic settings. By collaborating with academic educators, learning developers can support the development of curriculum-enabling artefacts, align content with pedagogical objectives, and focus on the crafting of engaging and accessible material for all students. As the integration of AI-generated content gains momentum, we anticipate that a key aspect of learning developer's responsibilities will involve offering guidance on both generating and using AI-generated content.

By working in close partnership with academic educators, learning developers can identify and advise on the most suitable types of content for AI-generated approaches, guaranteeing alignment with the course's learning goals. It is likely that learning developers' roles will evolve to encompass the development of processes to enhance AI-developed artefacts, the identification and mitigation of potential biases within AI-generated content and ensuring accessibility for every student. Additionally, in cooperation with academic educators, by leveraging data on student performance and engagement, learning developers may pinpoint areas requiring improvement and content enhancement. We foresee that such skills will become vital for maintaining the effectiveness, engagement, and alignment of AI-generated content with pedagogical objectives.

## **Learning Management Systems (LMSs): Implications for Content Delivery**

We expect that Learning Management Systems (LMSs) will be significantly influenced by the growing integration opportunities that AI-generated content affords. For example, content creation and management automation and streamlining can support teaching staff to prioritise student guidance and engagement, rather than potentially labour-intensive tasks related to creating and updating course materials. We are already seeing early signs of highly personalised, AI-informed learning journeys for students through product offerings from private providers (e.g., Chegg, 2023; Khan Academy, 2023). Higher education institutions have been slower to adapt inside their LMS delivery to remain relevant in this changing education market.

This leads us to next discuss various factors to consider when crafting effective prompts, particularly in the context of using conversational-style AI models like ChatGPT.

## **Crafting Effective Prompts**

### **The Process of Prompt Engineering**

Through our learnings, obtained through hundreds of hours of practical experimentation with AI tools, we arrived at a systematic approach to writing effective prompts for use with conversation-style AI models. Below, we offer a high-level overview of the steps involved in our process (see Table 1). The process begins by defining the goal to be achieved by the AI model, then specifying the form which the generated content should take, then writing the prompt, and testing and iterating the phrasing of prompts until the desired goal is achieved.

**Table 1.**  
*Prompt writing steps*

| <b>Step</b>                                 | <b>Action</b>   |
|---|---|
| <i>1. Define Goal</i>                       | Identify the specific outcomes you want the AI to achieve. This will ensure the prompt aligns with your goal (e.g., learning objectives).   |
| <i>2. Determine Content Type and Format</i> | Decide on the type of content (e.g., quiz questions, case study) and the format (e.g., multiple choice, long answer) that best fits your objectives and context.  |
| <i>3. Craft Initial Prompt</i>              | Create a clear, concise prompt that effectively communicates the desired content and format to the AI model. Make sure to include necessary context, instructions, and parameters to guide the AI model towards the desired output. |
| <i>4. Initial Testing/Prototyping</i>       | Input the prompt into the AI model to generate an initial output.   |
| <i>5. Reflect on the Output</i>             | Evaluate the AI-generated content to see if it aligns with your intended goal.  |
| <i>6. Iterate</i>                           | If the content doesn't meet your expectations, refine the prompt by adjusting the context, instruction, or constraints. Repeat the process until you achieve the desired output.  |

When crafting the initial prompt, employing precise and unambiguous language should help guide the AI model towards producing content that aligns with your predetermined goals. To facilitate this process, we recommend incorporating several components into the written prompt, as outlined in Table 2.

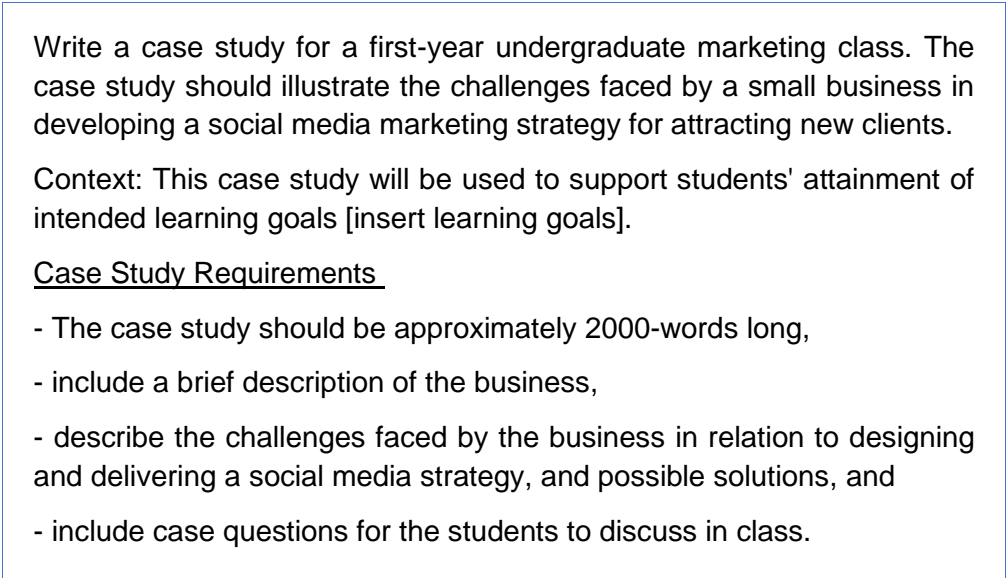
**Table 2.**  
*Prompt components*

| <b>Component</b>           | <b>Purpose</b>   | <b>Example</b>  |
|----------------------------|--|---|
| <i>Verb</i>                | Indicates a specific action to be performed.   | 'Write...'  |
| <i>Focus</i>               | Provides the process, product, or outcome of the action to be performed (in relation to the 'verb')  | '...a case study...'  |
| <i>Context</i>             | Explains the scope or parameters of the task.  | '...for a first-year undergraduate marketing class.'  |
| <i>Focus and Condition</i> | Provides the focus and condition for the generated output, defining the subject matter and the primary goal. This information can help to narrow down the scope of the task and clarify what the content should include. | 'The case study should illustrate the challenges faced by a small business in developing a social media marketing strategy for attracting new clients.' |
| <i>Alignment</i>           | Instructs the AI model to align content with your desired goal.  | 'The case study will be used to support students' attainment of   |

|                                    |   |  |
|------------------------------------|---|--|
|                                    |   | intended learning outcomes [insert learning goals].’   |
| <i>Constraints and Limitations</i> | Note any constraints or limitations that the AI model should adhere to. | ‘The case study should be approximately 2000-words long, include a brief description of the business, and describe the challenges faced by the business in relation to designing and delivering a social media strategy, and possible solutions, and include case questions for the students to discuss in class.’ |

---

We offer the following prompt (see Figure 1) as an example of operationalising the above recommendations (per Table 2).



**Figure 1.**  
*Case study prompt example for an undergraduate marketing class.*

**Aligning Prompts with Learning Goals and Assessment Criteria**

To be useful for generating teaching materials, prompts should provide guidance to the AI model for generating content that helps students reach specific outcomes, such as understanding key concepts, applying theories, or analysing complex problems. By maintaining a clear focus on learning goals, educators can write prompts that lead to meaningful and pedagogically sound content, tailored to the needs and goals of their student cohorts. We provide three example prompts (see Table 3) to illustrate how prompts may be written. The example prompts include placeholder text (e.g., ‘[insert topic]’, ‘[insert learning goals]’) which should be replaced when using with an AI chatbot, as is relevant to the educational scenario.

**Table 3.**  
*Learning goal aligned prompt examples*

| <b>Context</b>                      | <b>Example Prompt</b>   |
|-------------------------------------|---|
| <i>Summarise key concepts</i>       | Generate a concise summary of the key concepts related to [insert topic] that aligns with the following learning objectives: [insert learning goal(s) and associated criteria]. The summary should be approximately 300 words in length and provide a clear overview of the subject matter.   |
| <i>Create illustrative examples</i> | Create a set of three real-world examples that illustrate the practical application of [insert topic] in the context of [insert learning goal(s) and associated criteria]. Each example should be accompanied by a brief explanation of how it demonstrates the learning objective(s).  |
| <i>Lesson plan development</i>      | Develop a lesson plan for a [insert class duration]-minute class session on [insert topic] that addresses the following learning goal(s): [insert learning goal(s) and associated criteria]. The plan should include a brief outline of the content to be covered, as well as suggested activities and assessments to support student learning. |

### Encouraging Critical Thinking and Problem-Solving Skills

Prompts that direct AI models to generate content have the potential to facilitate the development of critical thinking and problem-solving skills in students (cf. Mahdi et al., 2020; Tsui, 2002). These prompts can be designed to encourage students to delve deeply into the subject matter, pose stimulating questions, or present practical situations that demand the application of acquired concepts. By employing such prompts (see Table 4), educators can foster an environment that stimulates active engagement and promotes higher-order thinking abilities among students.

**Table 4.**  
*Critical thinking and problem-solving skill aligned prompt examples*

| <b>Context</b>              | <b>Example Prompt</b>   |
|-----------------------------|---|
| <i>Scenario</i>             | Craft a complex scenario related to [insert topic] that requires students to apply their knowledge and critical thinking skills to solve a problem or make a decision. The scenario should be approximately 250 words long and include a clear problem statement, relevant contextual information, and potential consequences                   |
| <i>Discussion questions</i> | Design five open-ended discussion questions related to [insert topic] that encourage students to engage in critical thinking, analysis, and debate. The questions should be thought-provoking, requiring students to reflect on the subject matter, evaluate different perspectives, and formulate their own opinions.                          |
| <i>Case study</i>           | Create a detailed case study exploring a real-life issue or challenge within the field of [insert topic]. The case study should present multiple perspectives on the issue, require students to analyse the situation and develop a well-reasoned solution, and align with the following learning objective(s): [insert learning objective(s)]. |



## Fostering Student Engagement and Interaction

Another important aspect for consideration in prompt writing for teaching practice is writing prompts aimed at fostering student engagement and interaction (see examples in Table 5). To promote active participation and collaboration, prompts can be designed to generate content that facilitates discussion, debate, or group activities. For example, prompts can be used to create case studies, role-playing scenarios, or debate topics that encourage students to share their perspectives, work together to solve problems and learn from one another. Academics can use the results of these prompts as the foundation for in-class activities that students can engage in as part of their learning. By crafting prompts that stimulate interaction, educators can leverage AI models to potentially generate ideas for more dynamic and engaging learning environments.

**Table 5.**

*Student engagement and interaction aligned prompt examples*

| Context                     | Example Prompt  |
|-----------------------------|---|
| <i>Role plays</i>           | Generate a role-playing activity related to [insert topic] that encourages students to engage with the material and interact with one another. The activity should be designed for small groups and include a clear description of the roles, objectives, and guidelines for the activity.  |
| Debates                     | Develop a set of five debate topics related to [insert topic] that will stimulate engaging class discussions and promote active participation among students. The topics should be controversial, relevant to the course content, and encourage students to think critically about the subject matter.  |
| Collaborative group project | Create a collaborative group project assignment focused on [insert topic] that fosters student interaction and engagement. The assignment should include a clear description of the project objectives, guidelines for collaboration, and an explanation of how the project aligns with the course's learning objectives: [insert learning objective(s)]. |

## Ensuring Prompts are Adaptable Across Learning Contexts

Prompts can also provide content that builds in flexibility for various learning contexts. This involves considering the diverse needs and backgrounds of students, as well as the specific requirements of different disciplines or courses. For example, educators might write a prompt that can be easily adjusted in terms of complexity, depth, or focus, ensuring that AI-generated content remains relevant and accessible to all students. Example prompt suggestions are provided in Table 6.

A key role for learning developers, and academic educators alike, will likely extend to articulating the roles and processes that support the functional design and application of prompts. For example, learning developers and academic educators may work together to develop processes (i.e., sequential steps) for writing prompts. These processes and example prompts may one day form 'prompt libraries' (i.e., repositories of prompts and prompt resources) which could be used as a reference source for prompt writing or replication in teaching contexts.

It is worth noting that AI advancement has been accompanied by emerging AI-focused industries and marketplaces containing such prompt libraries. One example is prompt marketplaces, where single prompts (as little as a couple of lines of text) are being sold and purchased (see for example: <https://promptbase.com>). We find it foreseeable that prompts (albeit dependent on their quality and adaptability) will soon become a significant intellectual property resource and comprise a new asset form that may be licensed or sold to third-party education providers.

**Table 6.**

*Adaptable across learning context aligned prompt examples*

| <b>Context</b>              | <b>Example Prompt</b>  |
|-----------------------------|--|
| <i>Question generation</i>  | Craft a series of questions related to [insert topic] that can be easily adapted to different levels of complexity and depth, allowing educators to modify the questions according to their students' needs and backgrounds. The questions should cover a range of difficulty levels and promote critical thinking and problem-solving skills.   |
| <i>Lesson plan template</i> | Generate a lesson plan template for teaching [insert topic] that can be customised to suit different learning contexts and objectives. The template should include sections for learning objectives, content outline, activities, and assessments, as well as guidance on how to adapt the plan for various contexts.  |
| <i>Rubric generation</i>    | Design an assessment rubric for evaluating student performance on a [insert assessment] related to [insert topic] that can be easily adjusted to reflect different learning objectives, criteria, or contexts. The rubric should include clear descriptions of performance levels and offer guidance on how to modify the criteria and standards according to specific needs and requirements. |

In conclusion, leveraging prompt writing in teaching practice offers numerous benefits, including alignment with learning objectives, the promotion of critical thinking and problem-solving skills, increased student engagement and interaction, and adaptability to different learning contexts. Education-centric prompts may also form new revenue streams for higher education institutions. We now turn to using prompts in the context of crafting assessment and learning experiences, leading to a case study example.

### **Assessment Design with AI-generated Content**

Prompts can be employed with AI chatbots to assist in the task of formulating assessments. Working in tandem with a systematic process and workflow (which we further detail in the case study below), prompts can incorporate information pertaining to learning goals and assessment criteria to aid in designing assessments.

This process can be undertaken through various methods. Firstly, it is crucial to ensure alignment between assessment prompts and learning objectives. This means that AI-generated assessment content should tightly correspond to the intended learning objectives, steering students towards fulfilling specific targets and demonstrating their comprehension of the course content. Secondly, one should strive to encompass a variety of assessment formats, using AI-generated content to

devise a spectrum of assessment formats, such as multiple-choice, short answer, and essay questions. This presents students with diverse opportunities to exhibit their understanding and abilities. Thirdly, aim to design assessments that challenge students. By crafting prompts that guide AI-generated content, one can create assessments that test students' critical thinking and problem-solving skills, encouraging them to apply their knowledge and engage more deeply with the material. Example prompts are provided in Table 7.

**Table 7.**

*Assessment aligned prompt examples*

| <b>Context</b>                   | <b>Example Prompt</b>  |
|----------------------------------|--|
| <i>Multiple choice questions</i> | Generate a set of 10 multiple-choice questions related to [insert topic] that assess students' understanding of the following learning objective(s): [insert learning objective(s)]. Each question should include a clear stem, four answer choices, and a brief explanation of the correct answer.  |
| <i>Short answer questions</i>    | Design a short answer assessment question related to [insert topic] that aligns with the following learning objective(s): [insert learning objective(s)]. The question should be open-ended, requiring students to demonstrate their understanding and application of the topic.   |
| <i>Essay questions</i>           | Create an essay question prompt for an assessment on [insert topic] that challenges students to critically analyse the subject matter and develop a well-reasoned argument. The prompt should clearly state the question, provide any necessary context, and align with the following learning objective(s): [insert learning objective(s)]. |

## Creating Learning Experiences for Diverse Student Needs

One advantage we found when using AI to generate content is its ability to design learning experiences that address the diverse needs and backgrounds of students (Sanger, 2020). By crafting prompts (see Table 8) that generate content tailored to different learning requirements, abilities, and preferences, educators can create inclusive and accessible learning environments.

**Table 8.**

*Diversity aligned prompt examples*

| <b>Context</b>       | <b>Example Prompt</b>   |
|----------------------|---|
| <i>Lesson plan</i>   | Create a differentiated lesson plan for teaching [insert topic] that addresses the diverse needs and abilities of students in the classroom, including [insert student needs]. The plan should include strategies for scaffolding, enrichment, and accommodation, as well as clear learning objectives [insert learning objective(s)] and a range of activities to engage all learners. |
| <i>Group project</i> | Design a group project related to [insert topic] that promotes collaboration and inclusivity among students with diverse backgrounds and abilities. The project should align with the following learning objective(s): [insert learning objective(s)],  |

and include guidelines for group formation, roles, and responsibilities, ensuring that all students can contribute to the project's success.

---

## **Case study**

To demonstrate how AI chatbots can be used for assessment design, we now outline a case example and AI-informed process piloted by a learning design team with a group of academic educators at The University of Tasmania, Australia.

### **The Challenge**

The learning design team was tasked with delivering a workshop to assist academic educators in achieving the task of redesigning assessments. The motivation for the workshop stemmed from the academic educators needing to enhance the embeddedness of skills development in students' educational journeys. Additionally, the group of academic educators sought to enhance the authenticity of their assessments to move towards combatting concerns of AI tool emergence associated with academic integrity risks.

Usually, the task of creating or redeveloping assessments is a time-intensive process. It typically involves ongoing collaboration between learning developers and academic educators, where they brainstorm ideas, devise prototypes, and formulate instructions for students. However, by using AI chatbots – in this case, ChatGPT – the process was expedited.

### **The Process**

To design the process, the learning developers drew from several recommendations within an Australasian Council on Open Distance and eLearning (ACODE) whitepaper (Venaruzzo et al., 2023). Specifically, the team focused on recommendation eight, which suggests that institutions prioritise assessment redesign by adopting more authentic forms of assessment to minimise the option for students to use AI-based tools in generating assessment content.

The process was shaped by the learning developers designing a linear series of prompts (inclusive of prompt examples provided in Figures 2-6) that were designed, tested, and modified before the workshop took place.

Broadly, this process involved first training ChatGPT on the high-level unit curriculum and authentic assessment design framework. Second, supporting divergent thinking in relation to authentic assessment. Then thirdly, facilitating convergent thinking to guide ChatGPT to assist in the selection and authoring of assessment tasks. Each stage involved several sequential steps that academics could use to elicit a specific response from ChatGPT. The series of prompts were designed to provide contextualised curriculum responses reflective of the subject matter. The use of a linear structuring of prompts further decentralised the professional expertise held by learning designers, enabling them to work across multiple assessment redesign concurrently and produce high-quality first drafts of assessments, no matter the underlying domain-specific content focus.

Prior to the workshop being delivered, multiple tests were carried out to evaluate and refine the wording and sequence of prompts. This included an iterative process whereby prompts were drafted and then entered into ChatGPT and then a process of reflection undertaken to ensure the

suitability of generated content or refining the wording of prompts accordingly and testing again. This resulted in the creation of a final prompt script, which was deemed to elicit a consistent and contextualised response from ChatGPT. Informal feedback provided by academic staff during the workshop indicated that the prompts did in fact elicit a consistent and contextualised response from ChatGPT, and thus represented a suitably valid and reliable process with which to aid assessment design to achieve the current assessment redesign challenge (see Figure 2 for an example).

Act as a Learning Designer. You are tasked with supporting an academic to redesign 3 assessments, for a 3rd university unit. The focus of this redesign is to brainstorm authentic assessment options for the unit. (Note: a unit is a subject or course within a degree).

Confirm understanding


Understood. As a Learning Designer, I have been tasked with supporting an academic to redesign three assessments for a third university unit. The focus of this redesign is to brainstorm authentic assessment options for the unit.



## Figure 2.

*ChatGPT being prompted to assume a given role and clarify the users intended task*

The next prompt (Figure 3) was used to introduce conditions (i.e., parameters) for the AI model to work with. This prompt can be viewed as a 'condition' with which to provide additional context to ChatGPT. A prompt such as this increases assurance that ChatGPT is aware of the type of authentic assessment required, thus making it evident that authentic assessment sits on a scale from proximal to simulation.

In the process of collaborating with the academic, we need to use the following Authentic Assessment Types. 




Proximal assessment - This type of assessment measures a student's ability to perform a task similar to what they would do in the real world. However, it is still a simplified or artificial version of the real thing. For example, a culinary student might be asked to prepare a dish under time pressure in a simulated kitchen environment.

Intermediate assessment - This type of assessment requires students to apply their knowledge and skills to real-world situations that are more complex and authentic than proximal tasks. For example, an engineering student might be asked to design a prototype for a product that meets a real-world need.

Authentic assessment - This type of assessment requires students to apply their knowledge and skills to real-world situations that closely mirror the complexity and demands of the tasks they will face in their future careers. For example, a medical student might be asked to diagnose and treat a patient with a complex medical condition.

Simulation assessment - This type of assessment involves using simulations or virtual environments that replicate real-world situations, allowing students to practice their skills in a safe and controlled environment. For example, a pilot trainee might be asked to fly a simulated aircraft under different weather conditions and emergency situations.

State that your confirm understanding.

I confirm that I understand the four types of Authentic Assessment mentioned: Proximal assessment, Intermediate assessment, Authentic assessment, and Simulation assessment. Proximal assessment involves tasks similar to real-world scenarios but simplified or artificial. Intermediate assessment requires applying knowledge and skills to complex real-world situations. Authentic assessment involves tasks that closely resemble the complexity and demands of future careers. Simulation assessment involves using virtual environments to practice skills in a controlled setting.   

### Figure 3.

*ChatGPT provided with additional context to complete the task.*

The subsequent prompt (see Figure 4) was used in the linear prompt process aimed to clearly display the vocational skills associated with a particular study unit, based on the learning goals. The content generated from this prompt offered users a variety of vocational skills connected to potential assessment choices, thereby serving as an indication of authentic alignment. The AI-generated output could then act as a reference for the academic and is designed to function as a brainstorming tool.

Perform an analysis on contemporary skills required by industry specific to the context of this unit. Use the Unit Description and Intended learning outcomes to inform the analysis. Provide 5 critical skills and suggest how authentic assessment could be used.

Based on the Unit Description and Intended Learning Outcomes, it is clear that this unit aims to prepare students for future work opportunities and develop their personal and professional skills. In order to be successful in the field of STEM, there are several contemporary skills that are highly valued by industry. Here are five critical skills that are relevant to this unit:

1. Collaboration and teamwork: In the context of this unit, students will need to work collaboratively and ethically with colleagues throughout the STEM experience. This requires strong collaboration and teamwork skills, including the ability to communicate effectively, listen actively, and work towards shared goals.

Authentic Assessment Option: Intermediate assessment. Students could be tasked with working in a small group to develop a solution to a complex STEM challenge, demonstrating their ability to collaborate effectively, communicate ideas clearly, and work towards shared goals.

2. Critical thinking and problem-solving: STEM professionals need to be able to analyze complex problems and develop effective solutions. This requires strong critical thinking and problem-solving skills, including the ability to identify relevant information, evaluate different options, and make informed decisions.

Authentic Assessment Option: Authentic assessment. Students could be presented with a real-world STEM problem, such as developing a sustainable energy solution for a community, and be required to apply their critical thinking and problem-solving skills to develop a comprehensive solution.

#### Figure 4.

*ChatGPT prompt that guided output to include focus on vocational skills alignment, helping to facilitate divergent thinking.*

The prompt and resultant output (see Figure 5) was designed to highlight skills or curriculum components that make sense to be assessed together. This is done to reduce over-assessing of students and develop efficiencies within a unit of study. The prompt asks the AI model to use input from earlier prompt outputs to identify assessment options that could be used to assess multiple learning goals (indicated in Figure 5 with the phrase 'intended learning outcomes and assessment criteria').

Using the above, suggest which intended learning outcomes and assessment criteria could be assessed in a common assessment method/ task.

If there isn't a common assessment method/ task, suggest a final assessment method, based on the authentic assessment brief.

Ensure assessment Criteria are considered.

Based on the suggested authentic assessment methods, it is possible to identify some intended learning outcomes and assessment criteria that could be assessed through a common assessment method/task.



For example, the simulation assessment option could be used to assess ILO 2 - "Collaborate professionally and ethically with colleagues throughout a STEM experience" and its corresponding assessment criteria 2.1, 2.2, and 2.3. The simulation could involve a team-based project where students are required to work together to solve a complex STEM-related problem while demonstrating professional and ethical behavior in their interactions with their team members. The simulation could be designed to mimic a real-world scenario, where students must navigate challenges that are common in professional settings, such as differing opinions and priorities, conflicting schedules, and communication barriers.

Alternatively, a final assessment method that could be used to assess all three intended learning outcomes and their corresponding assessment criteria could be a portfolio. The portfolio could be a collection of artifacts, reflections, and self-assessments that demonstrate the student's ability to assess the impact of STEM on society, collaborate professionally and ethically with colleagues throughout a STEM experience, and evaluate their readiness for future work opportunities by reflecting on personal and professional development during a specific experience. The portfolio could include a variety of authentic assessments, such as case studies, project reports, peer evaluations, self-reflections, and action plans, that provide evidence of the student's achievement of each intended learning outcome and their corresponding assessment criteria.

### Figure 5.




*ChatGPT prompt used to guide output to align skills with curriculum components.*

A further prompt (shown in Figure 6) was used to ask the AI model to identify six implicit skills that may be present in a Portfolio assessment (i.e., one of the assessment types explored during the workshop). A prompt such as this aimed to help identify underlining (i.e., implicit) skills within an assessment. With the information obtained from the AI model, the academic educator was able to gain an awareness of what needed to be taught to students to prepare them with the skills needed to complete assessment tasks. Additionally, this awareness was used to help in the development of learning activities, which AI models were later used to generate.



Propose 6 underlying skills that students will need to develop to perform well in the STEM and Society Portfolio assessment.

The proposed list of skills should include 3 that are industry specific and 3 that are academic- specific.

Here are six underlying skills that students will need to develop to perform well in the STEM and Society Portfolio assessment:   

Industry-specific skills:

1. Collaboration and teamwork: The ability to work effectively with others, share ideas and responsibilities, and collaborate towards a common goal is essential for success in any STEM-related field.
2. Problem-solving: The ability to identify, analyze, and solve complex problems is a critical skill in the STEM industry. Students need to demonstrate the ability to apply logical and analytical thinking to develop innovative solutions to real-world challenges.
3. Ethical and professional behavior: Students must demonstrate professional conduct and ethics when working with colleagues, clients, and stakeholders in the STEM industry. This includes showing respect, honesty, and integrity in all interactions.

Academic-specific skills:

1. Critical thinking: The ability to think critically, analyze information, and evaluate arguments is crucial for success in academic settings. Students must be able to draw conclusions and make informed decisions based on evidence and logical reasoning.
2. Research and analysis: Students must demonstrate the ability to conduct independent research, gather and analyze data, and synthesize information from multiple sources.
3. Self-reflection and evaluation: Students must be able to reflect on their own learning and evaluate their own progress towards achieving the learning outcomes of the assessment. This includes identifying areas of strength and weakness, setting goals for improvement, and seeking feedback to enhance their performance.

**Figure 6.**

*ChatGPT prompt used to identify underlying or implicit skills within an assessment.*

## Workshop Reflections

Although originally designed to aid in the development of authentic assessments, the prompting process was also intended to introduce academic educators to the practical application of ChatGPT. Many workshop participants had only used ChatGPT superficially. As workshop participants were exposed to increasingly sophisticated responses from the AI model, they began to reflect on the potential impact of this technology on higher education. Initially, some academic

educators expressed resistance and discomfort as they grappled with the blurring of boundaries between human expertise and AI capabilities.

As the academic educators progressed through the phases of the process, they started to appreciate the productive affordances of the technology and sought additional opportunities to use it. They also acknowledge that although generative AI tools will likely reshape the nature of work in the higher education sector, these technologies can also positively contribute to the creation of high-quality educational materials and help to craft better student experiences. While this technology raises new questions and challenges for academics, learning developers, and students alike, participants of the workshop generally recognised that resisting this technology would be counterproductive.

It is necessary to acknowledge that further iterations and refinement was required post-workshop to achieve the initially stated challenge. However, using AI tools enabled academic educators to complete approximately 80 percent of the required work in the assessment design task. For the learning developers, implementing an AI-augmented process resulted in potentially translating several months of design work into a 40-minute workshop experience. Ultimately, this case demonstrates significant potential for AI to enhance learning and teaching.

## **Conclusion**

As we continue to 'build the aeroplane as we are flying it' amidst the rapid advancements of AI technologies, and their influence on the higher education sector, we acknowledge that there is no one clear path forward. We therefore offer broad-brush suggestions to help guide the sector towards a positive future.

Firstly, we advocate for deeper understanding of AI tools. This involves exploring their features and experimenting with their functionalities to better grasp their capabilities, limitations, and inherent biases.

Secondly, it is essential to establish clear objectives. When using AI-generated content, specific learning goals should be defined to ensure that the application of AI tools enhances learning and is in alignment with these objectives. This strategic approach will ensure that AI is not used merely for its novelty, but for its potential to enrich learning experiences.

Thirdly, we suggest a gradual implementation of AI content. This approach involves introducing AI-generated content in a step-by-step manner, starting with simpler tasks, and progressively advancing towards more complex activities. This incremental approach allows for a smoother transition and provides ample opportunities for feedback and adjustment.

Lastly, we emphasise the need for enhanced support and guidance. Educators are in a prime position to assist students in navigating the use of AI tools and ensuring that students comprehend the purpose and relevance of AI-generated content in their learning journey. However, it is important to note that the process of imparting AI literacies to students begins with the development of these literacies among educators. Therefore, professional development in this area is of paramount importance.

Through this Commentary, we highlighted the significance of prompt engineering in higher education by examining its key components, showcasing example prompts across various teaching contexts, and presenting a specific case study demonstrating how prompts can be employed to create assessments and learning experiences aligned with learning goals and industry-based skills. We also proposed strategies for navigating the anticipated widespread adoption of AI in education. Moving forward, we firmly advocate for thoughtful and deliberate integration of AI, underpinned by curiosity, adaptability, and skill development, to prepare the sector for the challenges and opportunities presented by the introduction of these new technologies. By transcending concerns over plagiarism and embracing the potential of AI tools to address current teaching obstacles, we anticipate that the education community will flourish in an increasingly AI-enhanced world.

### **Conflict of Interest**

The authors disclose that they have not received any funding for this manuscript beyond resourcing for their time at their university.

### **Acknowledgement**

The authors acknowledge the use of ChatGPT (<https://chat.openai.com/chat>), an artificial intelligence model developed by OpenAI, in the editing process of this article and in the production of AI-generated content to provide readers with illustrations of AI-generated content (see Figures 2-6).

## References

- Bjork, C. (2023). Don't fret about students using ChatGPT to cheat – AI is a bigger threat to educational equality. *The Conversation*. <https://theconversation.com/dont-fret-about-students-using-chatgpt-to-cheat-ai-is-a-bigger-threat-to-educational-equality-202842>
- Cassidy, C. (2023, January 10). Australian universities to return to 'pen and paper' exams after students caught using AI to write essays. *The Guardian*. <https://www.theguardian.com/australia-news/2023/jan/10/universities-to-return-to-pen-and-paper-exams-after-students-caught-using-ai-to-write-essays>
- Chegg. (2023). *Understand a topic*. <https://www.chegg.com/understand-a-topic>
- Cotton, D., Cotton, P. A., & Shipway, J. R. (2023). Chatting and cheating: Ensuring academic integrity in the era of ChatGPT. *Innovations in Education and Teaching International*, 1–12. <https://doi.org/10.1080/14703297.2023.2190148>
- Crawford, J., Cowling, M., & Allen, K. (2023). Leadership is needed for ethical ChatGPT: Character, assessment, and learning using artificial intelligence (AI). *Journal of University Teaching and Learning Practice*, 20(3). <https://doi.org/10.53761/1.20.3.02>
- Dignum, V. (2021). The role and challenges of education for responsible AI. *London Review of Education*, 19(1). <https://doi.org/10.14324/lre.19.1.01>
- Khan Academy. (2023). *World-class AI for education*. <https://www.khanacademy.org/khan-labs>
- Kung, T. H., Cheatham, M., Medenilla, A., Sillos, C., De Leon, L., Elepaño, C., Madriaga, M., Aggabao, R., Diaz-Candido, G., Maningo, J., & Tseng, V. (2023). Performance of ChatGPT on USMLE: Potential for AI-assisted medical education using large language models. *PLOS Digital Health*, 2(2), e0000198. <https://doi.org/10.1371/journal.pdig.0000198>
- Mahdi, O. R., Nassar, I. A., & Almuslamani, H. A. I. (2020). The role of using case studies method in improving students' critical thinking skills in higher education. *International Journal of Higher Education*, 9(2), 297-308. <https://doi.org/10.5430/ijhe.v9n2p297>
- McCallum, B. S. (2023, April 1). ChatGPT banned in Italy over privacy concerns. *BBC News*. <https://www.bbc.com/news/technology-65139406>
- Pavlik, J. V. (2023). Collaborating With ChatGPT: Considering the implications of generative Artificial Intelligence for journalism and media education. *Journalism & Mass Communication Educator*, 107769582211495. <https://doi.org/10.1177/10776958221149577>

- Perkins, M. (2023). Academic integrity considerations of AI Large Language Models in the post-pandemic era: ChatGPT and beyond. *Journal of University Teaching and Learning Practice*, 20(2). <https://doi.org/10.53761/1.20.02.07>
- Sanger, C. S. (2020). Inclusive pedagogy and universal design approaches for diverse learning environments. In *Springer eBooks* (pp. 31–71). [https://doi.org/10.1007/978-981-15-1628-3\\_2](https://doi.org/10.1007/978-981-15-1628-3_2)
- Short, C. E., & Short, J. C. (2023). The artificially intelligent entrepreneur: ChatGPT, prompt engineering, and entrepreneurial rhetoric creation. *Journal of Business Venturing Insights*, 19, e00388. <https://doi.org/10.1016/j.jbvi.2023.e00388>
- Taylor, A., Nelson, J., O'Donnell, S., Davies, E., & Hillary, J. (2022). The skills imperative 2035: What does the literature tell us about essential skills most needed for work? Working Paper 1. *National Foundation for Educational Research*.
- Tsui, L. (2002). Fostering critical thinking through effective pedagogy. *The Journal of Higher Education*, 73(6), 740–763. <https://doi.org/10.1080/00221546.2002.11777179>
- Venaruzzo, L., Ames, K., & Leichtweis, S. (2023). Embracing AI for student and staff productivity: An ACODE Whitepaper based on the ACODE 88 Workshop and Roundtables. ASCILITE Publications, 1-8. [https://www.acode.edu.au/pluginfile.php/13426/mod\\_resource/content/5/ACODE88-Whitepaper.pdf](https://www.acode.edu.au/pluginfile.php/13426/mod_resource/content/5/ACODE88-Whitepaper.pdf)