

Co-constructing skills for ChatGPT at university

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This is a critical reflection on our teaching practice experiences using the generative AI tool, ChatGPT, in a Semester 1, 2023, fourth year digital technologies unit in an Australian University Initial Teacher Education program. We start with an outline of three pedagogical approaches where ChatGPT was embraced. We then draw upon our workshop observations and student assignments to provide insight into how students and educators used ChatGPT to co-construct technological knowledge and reinforce digital literacy. We conclude with reflections on the importance of explicit teaching and playful tinkering with ChatGPT to inform and support educators in building innovative teaching methods.

Key Words: Co-constructed learning, university, playful tinkering, generative artificial intelligence.

1. Context

In January and February 2023, Australian news services reported the prevalence of ChatGPT and the decision by Australian schools to ban or block its use in schools (e.g. ABC news, 2023; 9news, 2023). As previously outlined in this journal, Artificial Intelligence (AI) has been used for a number of years in society with great impact and can be both positive and negative (e.g. Pretorius, 2023; Wilson & Billam, 2023). Yet, the release of the generative AI tool, ChatGPT, in late 2022 (OpenAI, 2023) changed the landscape with the release of a free, user-friendly application. Following this release, concern about how educators and students would be impacted was, and continues to be, a hot topic of discussion in the media and throughout education sectors (e.g. Cotton et al., 2023; Ziebell & Skeat, 2023). Unlike the school sector at this time, our university took the approach to proactively develop policy to [educate staff and students on educational and ethical use of generative AI](#).

This article outlines the teaching and learning experiences of two educators (the authors) in an Australian university Initial Teacher Education program technologies unit. Although, as educators, we had been researching and teaching in the field of technologies for some years, we were not experts in understanding and using generative AI tools, such as ChatGPT. So, in early February 2023, we (the Chief Examiner and the tutor) challenged ourselves to actively engage in critical and innovative ways to use generative AI in a unit. The unit was offered to fourth year Pre-Service Teachers (PSTs) in the primary stream to explore how to effectively employ digital technologies in their teaching. In this eight-week unit, 39 PSTs, allocated to two workshops, explored and used a range of digital technologies and devices. The PSTs were encouraged to challenge traditional assumptions of teaching and learning and to engage in critical debates within the Technologies Learning Area (Australian Curriculum, Assessment and Reporting Authority [ACARA], 2023a). Using their curriculum, assessment and reporting knowledge, PSTs exercised their creativity to design learning sequences appropriate for primary school students and build their pedagogical and technological knowledge.

The unit was structured to include a weekly online interactive module designed using Google Slides with information, quizzes, and links to additional resources and readings, eight scheduled three-hour face to face workshops, and two assessment tasks. As an example of a typical week, in Week 4 the online module topic was Safety and Ethics, which included teacher responsibilities and teaching students to be safe, critical thinkers. The Week 4 face-to-face workshop included a debate about whether educational software is worth the privacy risk in terms of student data collection. This workshop was followed by a learning activity where PSTs signed up to and used [Scratch.mit.edu](https://scratch.mit.edu) (a free educational block-based visual programming language) to create a game, which was then unpacked in terms of teaching safety when signing up to online platforms. The first assessment task required PSTs to, firstly, sign up to and present one weekly group debate in the workshop, and secondly, write a journal entry for other debates, providing a critical reflection of 200 words on the topics. The second assessment task was a problem-solving case study.

Permission to use unit assignments for research had been obtained from the university ethics committee (Project ID 36869) and all PSTs were informed verbally and in writing that we would like to use their assignments, particularly their reflections, in this research project. PSTs were presented with a choice to participate or to opt-out with neither choice having an impact on their grade. Each week during the semester, we deconstructed the workshop and recorded our observations and experiences. As this was a new unit, we adopted an open, collaborative classroom and both tutors would attend both workshops if available. For this article, the data presented is a reflective analysis drawn from our recorded observations and experiences, and student assignments.

Our rationale, as educators, to embrace generative AI tools such as ChatGPT was fourfold:

- Firstly, to build our professional knowledge of new technologies and how to utilise this knowledge within our teaching practice.
- Secondly, to build PSTs' technological knowledge through modelling and explicit teaching with ChatGPT in class activities.
- Thirdly, we were curious about how PSTs would use ChatGPT in their assignments.
- And fourthly, to analyse and reflect on our learning in using ChatGPT to improve our teaching practice and to share our new knowledge with colleagues.

2. Building professional knowledge of ChatGPT: Ours and our students'

The approach taken by our university to consider the educational potential of applications such as ChatGPT presented an opportunity for us to experiment with AI in our unit about using technologies in education. This opportunity was consistent with the fact that any line that existed between digital, media and traditional literacies has become increasingly blurred as digital technologies become more sophisticated and pervasive, as acknowledged in research around multi-literacies (The New London Group, 1996) and multimodalities (Cope & Kalantzis, 2009).

From our perspective, AI literacy is crucial for PSTs as, not only can it benefit them as students, but they are also required to teach digital literacy to their own students. AI programs, such as ChatGPT, are intermediaries in the writing process. In order to write a useful prompt for ChatGPT, students need digital literacy, in particular investigative skills (ACARA, 2023b), to understand how AI works. Similarly, to render the responses from ChatGPT useful, students need media literacy and critical literacy skills (Leander & Burriss, 2020). This mix of literacy skills has been labelled AI literacy (Ng et al., 2021), which is more closely related to the Australian Curriculum Critical and Creative General Capability than the Digital Literacy General Capability (ACARA, 2023b).

Initial research into the uses and value of AI for educational purposes at the university level are starting to appear. For example, Kong et al. (2021) found that participating in an AI literacy unit at university helped students see the usefulness of AI for education. In addition, generative AI has

been evidenced as time saving for students and educators (Limna et al., 2023), and engineering students found it simple to use yet recognised it as unreliable (Shoufan, 2023). The unreliability concern of generative AI was also raised by university educators who were encouraging students to use generative AI as “a *starting point*”, yet highlighted potential inaccuracies (Pretorius, 2023, T6) and outlined the need for safe and ethical usage (Tlili et al., 2023; Ziebell & Skeat, 2023).

AI literacy was therefore an obvious area of exploration for a digital technologies in education unit as teachers are already confronted with student work created using generative AI such as ChatGPT. Furthermore, we wanted to examine AI use in terms of increasing teacher efficiency, educating future teachers about AI, strategies for including AI in learning and teaching with their own students, and use of AI in assignments.

At first, we needed to educate ourselves about how generative AI worked, which included playing or tinkering with the applications and attending lectures and discussions about AI in education. Based on our understanding, we decided on the following educational goals:

1. Use ChatGPT to create the rubric for the unit assessment and to give feedback on weekly journal posts. We wanted with this goal to explore whether AI could reduce the amount of time we spent creating and grading assignments.
2. Explain to PSTs what generative AI is and give them an opportunity to play with AI during class in order to ensure they had used AI before forming an opinion about it.
3. Provide an opportunity for PSTs to use AI in their assignments. In pursuing this goal, we followed the university guidelines which required students to provide a statement of how AI had been used in their assignment. In addition, we also added in a question about how helpful PSTs had found the AI. We wanted to observe not only how they used AI but also their evaluation of its usefulness.

3. Modelling and explicit teaching

At the start of the unit in the Week 1 workshop, PSTs were informed that the rubrics had been written using AI and that the feedback on their weekly journal entries was going to be written using ChatGPT so that we could trial it in terms of teacher efficiency.

3.1. Rubric created with ChatGPT

The prompt used to write the rubric using ChatGPT was: “Write a rubric with High Distinction, Distinction, Credit, Pass and Fail descriptions for the following criteria”, followed by a list of criteria, for example: “Understanding of Connectivism: It is clear that the student has a strong grasp of Connectivism, PLEs and PLNs”.¹

For this particular criterion, the following output was used without modification in the rubric:

High Distinction: The student's understanding of Connectivism, PLEs, and PLNs is exceptional, with a sophisticated analysis of how these concepts can inform PD.

Distinction: The student's understanding of Connectivism, PLEs, and PLNs is well-developed, with a clear analysis of how these concepts can inform PD.

Credit: The student's understanding of Connectivism, PLEs, and PLNs is adequate, with a basic analysis of how these concepts can inform PD.

Pass: The student's understanding of Connectivism, PLEs, and PLNs is limited, with a simplistic analysis of how these concepts can inform PD.

Fail: The student's understanding of Connectivism, PLEs, and PLNs is poor, with no or very limited analysis of how these concepts can inform PD.

¹ PLE = personal learning environment; PLN = personal learning network; PD = professional development.

For the feedback, we showed the PSTs the prompt we were using and let them know that their assignments were going to be put into ChatGPT with the prompt and sought their opinions. PSTs had little to contribute other than acknowledgement. Thus, we were modelling the trialling of new technology for the PSTs and encouraged them to engage with us as co-creators of the unit knowledge. After the first round of journal entries, the use of ChatGPT for the feedback was broached in class in terms of its quality. We were surprised that PSTs did not have a lot to say. From the PSTs' comments, we found not many had read their feedback! This prompted us to consider whether students reviewed the grade only (see Crisp, 2007; Rowe & Wood, 2007). By the end of the unit, students were still unperturbed that we had used ChatGPT for feedback, offering us neither positive nor negative critique. Our views on the quality of the feedback are given in the next sub-section.

3.2. The feedback prompt and a reflection on the quality of ChatGPT's feedback

The prompt used to provide feedback for the debate journal entries was:

Beginning by emphasising what they did well, and praising them for any change in thinking, provide brief constructive feedback for the student on their reflection on a debate about TPACK [a technologies model developed by Mishra & Koehler, 2006], which side won and how it impacted their ideas:
<200-word student journal entry copied and pasted in.>

Typically, ChatGPT produced responses that followed the formula set out in the prompt, for example:

Great job on providing a balanced and thorough reflection on the debate! Your feedback highlights the strengths of both teams while also acknowledging their weaknesses. You particularly praised the opposing team's ability to use critical thinking skills and connect Shulman's model to the AITSL standards. Your feedback also demonstrates that you have gained a deeper understanding of the debate topic, particularly the relationship between XK and PK. However, you could have provided more specific examples of how the teams presented their arguments to make your feedback more impactful. Overall, well done!

This response was copied and pasted without modification as feedback for the student, followed by, "Written by ChatGPT" and any additional feedback provided by the tutor. In this case: "Note from <tutor name>: I thought you had enough specific examples!" From our teaching perspective, as an effective teaching resource, the generated response reflected the quality of our prompt and at times (as illustrated above) was bland and predictable. It also contained comments that we disagreed with and we would have to critique the responses. However, for future iterations of the course, we believe that automated ChatGPT feedback has the potential to be used to provide a response frame into which we could add personalised comments.

In addition to using ChatGPT for the rubric and feedback, the odd number of PSTs in the class meant that there were unexpected gaps in the debating teams, so the educators explained to the PSTs that they were going to use ChatGPT to help write the missing speeches. Simple prompts were used to elicit ideas, for example: "Why is content knowledge important for teachers?" "Why is technological knowledge so important for teachers?" However, this was not found to be particularly helpful as the content generated was generic and unrelated to the unit content, so instead the tutors wrote a quick draft of a response and then pasted it into ChatGPT with prompts such as: "Rewrite this debate speech in 300 words" which was much more helpful. The speeches were read out by the tutors in the debates.

3.3. Use of AI in the workshop

During the Week 6 workshop, we explained AI by comparing it to “predictive text on steroids”. PSTs used their phones to create a sentence using predictive text which helped them understand that AI imitates human language rather than human thinking. We also looked at some prompt engineering examples. Drawing on playful tinkering pedagogy (see Parry & Taylor, 2021) in order to put ideas into action, PSTs were tasked with a group activity where they were required to use AI to create a 30 second campaign video for an “evil American” who was running for a federal government seat in their area. All the images and text were to be created using AI, the text was read using text to speech software, and all of this was put into PowerPoint and saved as a video. We also modelled the use of a prompt for ChatGPT known as “DAN”, which stands for “do anything now” (Dataconomy Media, 2023), to help PSTs “break” ChatGPT or get it to do something that violated its content policy. This was done as understanding that and how a program can be exploited and manipulated is an important part of digital literacy. It was also done in order to extend the PSTs’ understanding of how well constructed prompts could be used and to reinforce the importance of establishing context.

When running the Week 6 activity, we noted that the majority of the class had already set up a ChatGPT account, thus indicating the reach of the new application.

Reflecting Bruner’s (1986) notion of communal learning, the unit focused on an open, shared learning culture where PSTs and tutors worked together to co-construct knowledge (Parr, 1999). As we were all new to ChatGPT, PSTs and tutors jointly built new learning. For example, in Week 6, PSTs wanted to create things the tutors had not anticipated or came up against barriers when using the software. For example, we had suggested they use [DALL-E](#) for their images, however, while the tutors had signed up for early adopter accounts that allowed them a number of free images per month, when the PSTs signed up they did not have any free images. PSTs were then encouraged to find their own AI image generators and soon they were shouting websites across the classroom, sharing ones they had used before or found in Google searches. Tutors took note of the websites and asked the PSTs to show us how to use them, and in turn, tutors gave advice about creating effective prompts.

Evidence that the prompt engineering discussion had an impact came when PSTs tried to get ChatGPT to write questionable campaign slogans and speeches that were against OpenAI guidelines. After understanding the importance of setting the context for the AI, PSTs quickly realised how simple it was to “break” ChatGPT and get it to write what they wanted it to. PSTs were motivated and engaged, and in a clear demonstration of Connectivism (Siemens, 2005), a unit topic, PSTs took full advantage of their personal learning networks. They searched for answers to questions online; they called and messaged relatives who worked with AI; and they bounced ideas off classmates and tutors who were in the classroom.

At the end of the session, each group played their advertisement to the class (see Figure 1 for an example) and there was a general discussion about what worked well, what was difficult, and how certain effects were achieved.



Figure 1. Example of an AI Campaign Video.

4. Student use of AI in their assignments

PSTs were reminded that they could use AI in their assignments. Figure 2 shows the instructions written on the Learning Management System for the first assessment task.

Generative AI tools are not restricted for this assessment task (but also, not required!)

In this assessment, you can use generative artificial intelligence (AI) to assist you in any way, but you must include an explanation of how you used it and whether it was useful. Any use of generative AI must be appropriately acknowledged (see [Learn HQ](#)).

For example, after entering your 3 minute speech transcript you would write:

I acknowledge the use of ChatGPT (<https://chat.openai.com>) to generate materials for background research and self-study in the drafting of this assessment. The following prompts were input into ChatGPT: "Brainstorm reasons why mobile phones should be banned in schools" and "Brainstorm debate topics for the ban of mobile phones in schools". I critiqued the responses and used some to write my journal entry. I found it useful for brainstorming because I was having trouble articulating my ideas and some of its responses expressed them in a better way than I could.

I acknowledge the use of ChatGPT (<https://chat.openai.com>) to generate materials that were included within my final assessment in modified form. The following prompts were input into ChatGPT: "Write 200 words on why mobile phones should be banned in schools". The resulting output was changed in the following ways: I modified the text to reflect the topics we actually used in the class discussion. I didn't find it especially useful because the ideas it came up with were generic and were not the ideas we spoke about in class. It would have taken less time to just write it from scratch.

If you did not use AI simply write:

No content generated by AI technologies has been presented as my own work

Figure 2. Assignment instructions about generative AI.

Given the choice to use generative AI in their assignments, as educators, we assumed most PSTs would do so. We had hoped that PSTs would use the invitation as an opportunity to extend their academic and technological learning skills.

Our data revealed that some PSTs did embrace and declared the use of ChatGPT in their assessment tasks. For example, in the first assessment task, writing a reflective learning journal, seven of the 39 PSTs (18%) declared their use of ChatGPT. These PSTs demonstrated their academic literacy skills by using the university recommended reference to ChatGPT. In addition, we had requested PSTs critique whether using ChatGPT was useful. As the following samples indicate, PSTs generally responded positively and with some precision in describing how they used the tool for such writing tasks as editing and brainstorming. For example:

AI technologies were used to edit my work ... I found it useful for simple edits and sometimes useful for rewording for greater clarity in my writing. (Student A)

I acknowledge the use of ChatGPT (<https://chat.openai.com>) to brainstorm ideas that were included within my final assignment in modified form. (Student B)

I found this useful in summarising the intention of TPACK for educators. (Student G)

A key learning point for us, as educators, was how important it was for the PSTs to have an awareness of prompt engineering and how to 'tweak' prompts. PSTs who indicated using multiple prompts stated the tool increased its usefulness by doing so. For example:

I used the following prompt "Edit this text to remove any errors and ensure clarity in writing: ...". I tweaked it a couple of times and ended up using a combination of some of the edits and my original writing. (Student A)

In using ChatGPT, some PSTs did exercise their critical literacy skills as they questioned the effectiveness of the tool. For example:

I found it useful in introducing arguments I had not considered, however, without the inclusion of references I found it difficult to use the points to spring-board further research. (Student B)

I critiqued the responses it produced but some ideas were generic or not as relevant to the topic as it had been presented in the week's relevant [university learning system] material. It helped speed up the process of getting some strong initial ideas flowing as a debating team before delving further into my own research and ways of articulating after we had established the arguments we wished to put forward. (Student C)

The PSTs' comments reflected the value of using generative AI to provide a framework for thinking about their assignments(?) and supporting them in the writing process.

5. Reflecting on our learning in using ChatGPT

Using ChatGPT has informed our teaching practice and enhanced our understanding of student learning in the following four ways.

Firstly, although the majority of PSTs in the AI topic workshop were aware of, and often had, their own ChatGPT accounts, it became clear that their AI literacy was low. This was indicated by their lack of confidence in using generative AI to effectively and efficiently support their academic learning and writing. Throughout the workshop, group members were constantly asking questions and 'Googling' how to use the AI tools. This lack of confidence was also reflected in the small number of PSTs who used AI in their assignments.

Secondly, although we gave PSTs the option to use generative AI in writing their responses following university guidelines, very few declared that they had used it. We found the PSTs' lack of experimentation somewhat disappointing given that we had explicitly taught and modelled the use of generative AI tools in the unit workshop. Lack of confidence with AI together with comfort with both traditional Google searches and the library search tools and databases to find academic references may be reasons for this lack of take up. This observation may reflect an idea which Bhatt and MacKenzie (2019, pp. 304-5) call an 'epistemology of ignorance' and reflects 'ritualised practices of digital literacy'. There is also the possibility that generative AI was used, but PSTs did not declare it. This possibility has emerged as an area we will research further.

Thirdly, during moderation and marking of the assignments, we were surprised to find how poorly some PSTs had integrated AI responses when it was used, making it very easy to pick up when PSTs had used ChatGPT. A sudden change in writing style and tone, or similarities between student responses with obscure ideas not related to the unit content were detected. As experienced educators, this reminded us of signals associated with plagiarism and prompted us to scroll to the bottom of the assignment for the ChatGPT statement, usually to find that the student had used ChatGPT. This lack of fluency may be explained in terms of the newness of ChatGPT. PSTs have not yet developed the skill to weave ideas from ChatGPT into their own writing. As literacies increase, we anticipate that PSTs will get better at synthesising the ideas from ChatGPT with their own writing. However, the formulaic (and at times erroneous) nature of the PSTs' writing when ChatGPT was used did cause us concern. In relation to this concern, Bearman and Ajjawi (2023) discuss the importance of students recognising "the rules of the game" (p. 5). In this case, PSTs should recognise the higher standards required for academic writing when employing AI. As more powerful generative AI becomes increasingly embedded in software writing applications (e.g. [Microsoft 365 Copilot](#)), its impact on style of writing and student creativity may become more evident.

Fourthly, despite workshop discussions and unit content about privacy and “data scraping” issues, the PSTs seemed surprisingly unfazed that their work was being uploaded into ChatGPT or that they were receiving feedback from a computer program rather than their tutor. This did not seem to reflect differing levels of digital literacy as some PSTs spoke of their awareness of giving away private information, and so used fake names or dates of birth when logging in to ChatGPT and other apps. This raised concerns for us, especially as we had focused on safety and ethics in the unit. It reflects similar findings of apathy about sharing data online (Southerton & Taylor, 2020). As the Australian Curriculum requires teachers to teach students about safety and ethics with digital technologies, this lack of concern about privacy issues and ethical use needs noting.

6. Informing future practice

Using generative AI in this unit did improve our teaching efficiency as it saved us time in preparation and providing feedback. We will continue to experiment with its use to assist us with teacher work. Our initial lack of AI literacy meant that there was a lot of adjustment to create prompts that gave us the output expected. However, our improving AI literacy corresponded with the greater usefulness of the generated material. We found generation of a rubric, which required minor prompt tinkering for context, to be extremely time effective. The provision of feedback on assignments was also time-effective, however, more time needs to be spent refining the prompt to provide better feedback. For example, in this trial we realised we had not mentioned the 200-word limit context in our prompt and as a result the output consistently suggested PSTs provide more examples, which would have taken them beyond the word limit and did not necessarily reflect the task instructions. With improved prompts generating instantaneous feedback, we estimate this would cut down the time spent on writing feedback by approximately half. An alternative might be a hybrid approach where the tutor refines the ChatGPT output, or puts feedback points into ChatGPT which writes them in a paragraph. However, such approaches may not result in any time savings. A major consideration for future use would be that student work was uploaded into ChatGPT which raises potential ethical concerns, even though this was a short piece with no personal information in it and we had verbal permission from the PSTs to upload their work in this way. Note however, that after we collected our data, OpenAI introduced into ChatGPT a data control feature allowing chat history to be turned off and excluding the data from being used for model training, which may address some of these concerns.

The importance of designing workshops that incorporate both explicit teaching and time for play was reinforced. Each time a new technology is used in class, both educators and students learn. The reactions of PSTs to the generative AI workshop activity made it clear that most PSTs were unaware how AI worked and few had taken the time to explore, play or tinker with the AI in a creative way. Our experience has underlined the importance of learning through playful tinkering as a fundamental pedagogical practice (Wohlwend et al., 2018) and we will continue to design workshops to include ‘play’ time.

The small number of PSTs who were able to use ChatGPT successfully in their assignments highlighted the importance of multiliteracy when using AI. In order for generative AI to be used effectively, we found there were various literacy skills that need to be pre-taught and student learning scaffolded. Such literacy skills include, for example:

1. Digital literacy, in terms of understanding how AI works in order to create useful prompts.
2. Critical or media literacy, in terms of evaluating the products of generative AI within a critical framework.
3. Academic literacy, in terms of understanding the format and style expected in an academic assessment, particularly the ability to synthesise ideas from ChatGPT in their own writing.

We plan to devote more time to building literacy skills by continuing to explicitly teach PSTs how to write prompts and help them differentiate between AI-generated and student-generated text within a critical framework. These skills are all represented in the Australian Curriculum’s

Critical and Creative Thinking General Capability in terms of inquiring, generating, analysing and reflecting (ACARA, 2023b). From our experience, it became clear that more emphasis needs to be placed on this capability if AI is going to become a useful tool in educational work. In addition, we can use our own experiences and observations of PSTs to point out possible pitfalls that may be encountered when using generative AI.

After teaching this unit, we believe it is important to continue to use and experiment with generative AI with PSTs and it will be included in future units. Building the technological knowledge and literacy skills needed to use generative AI tools is a means to empower all students and contributes to creating discerning digital citizens. However, as with any knowledge area, our experience highlights the need for, and the importance of, pre-teaching rather than assuming students have the required skills.

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ChatGPT was not used to write this report.

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