

Reimagining pedagogy for the GenAI era: Frameworks, challenges and institutional strategies

Meena Jha

College of ICT, School of Engineering and Technology, Central Queensland University, Australia

Amara Atif

School of Computer Science, Faculty of Engineering and Information Technology, University of Technology Sydney, Australia

While higher education institutions have updated their policies and issued guidelines to support ethical use of generative artificial intelligence (GenAI), translating these into effective classroom practices remains a significant challenge. This study explores how educators in Australian higher education are taking GenAI into their teaching to support students learning and foster critical thinking. The study draws on theoretical perspectives from critical digital pedagogy, AI Digital literacy and constructivist learning theory aligning it to Bloom's taxonomy. Through two in-depth case studies, the paper presents examples of how GenAI is being meaningfully embedded into teaching activities, reflective exercises and student-driven inquiry. The findings highlight variability in student readiness, the cognitive demands of critically engaging with GenAI and the importance of scaffolded, iterative approaches. Educators reported enthusiasm and strain in managing GenAI integration, noting the importance of explicit instruction, reflective practice and peer learning. The study offers a practical framework for embedding GenAI in learning environments and contributes to a growing body of knowledge on how educators can promote ethical GenAI literacy and uphold academic integrity through thoughtfully designed pedagogical strategies. While situated in the Australian higher education context, the study's insights offer transferable strategies for fostering ethical and critical engagement with GenAI.

Implications for practice or policy:

- Educators can foster GenAI literacy by embedding scaffolded, critical reflection tasks on GenAI use into classroom practices.
- Educators should standardise GenAI usage templates across units to promote transparency and academic integrity.
- Educators could improve assessment authenticity by integrating GenAI-assisted stages that culminate in human-led critical evaluation.
- Administrators should support cross-functional collaboration to embed GenAI literacy into curricula, staff training and student support systems.

Keywords: generative artificial intelligence (GenAI), critical digital pedagogy, GenAI digital literacy, constructivist learning theory, higher education teaching practices, educational technology, case study

Introduction

Generative artificial intelligence (GenAI) capabilities are reshaping how students engage with academic work, and how educators design learning resources and assessments (Chiu, 2023; Liu, 2023). Universities worldwide are taking varied approaches to address GenAI at both policy (Australian Academic Integrity Network Generative AI Working Group, 2023; McDonald et al., 2025) and guidance levels (Tertiary Education Quality and Standards Agency [TEQSA], 2023).

The advent of GenAI has catalysed rapid and in some cases, hasty policy changes across higher education (An et al., 2025). Educators require clear guidance on using GenAI and how assessments can be transformed (Gruenhagen et al., 2024). Universities have acted swiftly in response to growing

concerns around academic integrity and the responsible use of AI tools to update existing frameworks or introduce and implement new ones (Lodge, 2024). While these top-down policies aim to uphold educational standards and manage institutional risk, they have also posed significant pressure on academics and have left students in confusion regarding the ethical and responsible use of GenAI.

There are many institutional guidelines provided for GenAI use (An et al., 2025). Academics are expected to translate broad, sometimes vague or restrictive guidelines into actionable teaching strategies – often with limited support and training (Al-Ali & Miles, 2025). As a result, many find themselves navigating a complex and sometimes contradictory terrain, where the desire to explore GenAI’s potential in learning and teaching is constrained by uncertainty, risk aversion, or unclear expectations (Atif, Lim et al., 2025). Recent work has shown that integrating GenAI into higher education requires teachers to develop new forms of knowledge and pedagogy, as conceptualised through the technological pedagogical content knowledge framework (Jha et al., 2025). While early adoption of GenAI in education was marked by resistance and ethical concerns, emerging research underscores a gradual shift toward recognising its pedagogical value and potential for personalised, inclusive learning (Kutty et al., 2024).

In Australia, TEQSA (2024) has published GenAI strategies for higher education, recommending tasks that require critical thinking, originality and contextualised responses, which this study extends through information and communications technology (ICT) case studies to examine how educators navigate mandates, redesign assessments and foster GenAI literacy. The research questions (RQs) investigated are:

RQ1: What kinds of pedagogical strategies and scaffolding approaches are used to promote critical, ethical and transparent use of GenAI in the classroom?

RQ2: What challenges and opportunities do educators encounter when integrating GenAI tools into classroom teaching and assessment practices?

The remainder of the paper unfolds by first mapping the GenAI policy–practice landscape in higher education, followed by an explanation of the theoretical frameworks that guide the study and their relevance to the research aims. It then details the methodological approach, including the research design, instructional design, participant profile and processes of data collection and analysis. The paper continues by presenting rich case studies that demonstrate how ICT educators are incorporating GenAI into classroom practice, before examining the key challenges and pedagogical concerns that arise in the implementation process. It concludes with a synthesis of recommendations and suggested directions for future research.

Policy-practice landscape in higher education

Despite institutional differences, Australian universities share several core practices in their GenAI strategies, as summarised in Table 1 (TEQSA, 2024, pp. 9–13). While the TEQSA report provides a broad overview of emerging institutional strategies, it provides limited, practice–oriented guidance for educators navigating day-to-day teaching realities.

Table 1
Key areas influenced by GenAI and common institutional actions

Category	Common actions across higher education institutions.
Strategic planning	Align GenAI policies with institutional goals, secure governance endorsement and ongoing review cycles.
Risk assessment	Include GenAI in risk registers, assess vulnerabilities in admissions and assessment, implement triage-based reform and conduct equity impact analysis.

Working groups	Establish multidisciplinary, formally endorsed teams to advise on policy, curriculum and implementation strategies.
Student engagement	Implement GenAI training modules, revise academic integrity policies, create student feedback loops and support equitable access initiatives (e.g., licenses for GenAI tools).
Staff development	Provide centralised training resources, foster GenAI communities of practice, incentivise innovation and update role-based onboarding updates.
Assessment reform	Shift towards authentic and process-based assessments (e.g., oral exams, portfolios), reduced reliance on essays and integrate GenAI tools where appropriate.
Systemic updates	Update learning management system (LMS) interfaces, marking rubrics, cover sheets and misconduct tracking systems to reflect GenAI policy and ethical use guidelines.
Communication strategy	Develop centralised, multi-modal communication hubs/platforms, newsletters, orientation materials, staff/student campaigns and transparency initiatives in discipline-specific GenAI policy implementation.
Industry and accreditation	Engage with professional bodies, update curricula to reflect industry practices and incorporate workplace GenAI expectations into learning outcomes.

In situating these practices, it is important to recognise the specific features of the Australian higher education system that shape GenAI adoption. The sector is highly diverse, encompassing research-intensive universities (Group of Eight), regional and teaching focused institutions such as Regional University Network, and dual sector providers that deliver both higher education and vocational training. These structural differences influence the extent of institutional capacity to invest in AI literacy resources, digital infrastructures and staff development initiatives (McDonald et al., 2025; TEQSA, 2024). Across the sector, financial pressures, such as declining public funding and reliance on international student enrolments, have intensified workloads for academic staff, creating challenges for consistent, pedagogically informed integration of GenAI (Lodge, 2024). The internationalisation of the student body also introduces distinct considerations. Large cohorts of international students (as in our case studies) can bring varied levels of digital literacy and expectations around academic integrity (Gruenhagen et al., 2025).

The professional accreditation body, the Australian Computer Society, is still refining their positions on GenAI, creating additional compliance pressures for programmes in ICT and related disciplines (Morris, 2025). These institutional and systemic factors highlight that the translation of national guidance (Australian Academic Integrity Network Generative AI Working Group, 2023; TEQSA, 2023) into classroom practice is mediated by resource constraints, regulatory expectations and student demographics. By positioning GenAI as a companion in assessment design, a framework proposed (Atif, Jha et al., 2025; Atif, Roth et al., 2025) informs both institutional strategy and future research directions, contributing to the development of responsible, evidence-informed approaches to GenAI-enabled assessment in higher education transforming policy to practice. While Table 1 summarises sector-wide strategies, our study extends this analysis by exploring how these strategies are translated into classroom practices through the two case studies, thereby connecting institutional concerns with pedagogical design.

The integration of GenAI into Australian higher education presents significant opportunities but also poses complex challenges. One major threat is to academic integrity, as GenAI-generated content increasingly blurs the distinction between original student work and machine-assisted outputs (Cotton et al., 2023; Dergaa et al., 2023; Dwivedi et al., 2023; Gruenhagen, 2024). This puts the validity of assessments and qualifications at risk (Corbin et al., 2025). Inconsistent communication across faculties and administrative systems further exacerbates confusion among students and staff about permissible

and ethical GenAI use (Dwivedi et al., 2023). Students from disadvantaged backgrounds may lack access to paid AI tools thereby deepening the digital divide (McDonald et al., 2025). While some universities have addressed access issues by providing institutional licenses, access alone doesn't resolve underlying inequities or ensure ethical, effective GenAI use (Yusuf et al., 2024). In this evolving context, classroom practices play a critical role in bridging the gap between policy and lived learning experiences.

This research addresses the urgent need for a grounded, pedagogically informed framework to help educators operationalise GenAI policies in meaningful and ethical ways. To navigate these emerging challenges and opportunities, a strong pedagogical foundation is essential. Understanding how GenAI can be meaningfully and ethically integrated into learning environments requires drawing on established educational theories that emphasise critical thinking, digital literacy and learner-centred practices. The next section outlines the theoretical frameworks underpinning this study, providing a conceptual lens through which GenAI integration in higher education can be examined.

Theoretical framework

The teaching and learning framework used in this study is guided by a composite model drawing on critical digital pedagogy (CDP) (Clark, 2018; Giroux, 2010; Masood & Haque, 2021; Morris & Stommel, 2017), digital and AI literacies (Cain & Coldwell-Neilson, 2024; Ng et al., 2021) and constructivist learning theory (CLT) (Bada, 2015; Hein, 1991), including Bloom's (1956) taxonomy. Together, these frameworks provide a multidimensional lens for examining how educators navigate the integration of GenAI tools in higher education classrooms. Their combined use enables a deeper understanding of not only what practices are emerging, but also why these practices develop and how they can be refined to support ethical, critical and pedagogically sound use of GenAI in classrooms and beyond as they also form the basis for behavioural change.

CDP (Masood & Haque, 2021) serves as the philosophical anchor of this study. This framework challenges traditional top-down models of technology integration and advocates for more equitable, reflexive and student-centred approaches to digital learning. Digital and AI literacies, drawing on work from organisations such as Joint Information Systems Committee (JISC) (Armstrong, 2025) and the American Association of Colleges and Universities (Watson & Rainie, 2025), provide an operational framework for evaluating how students and educators understand, engage with and critically assess GenAI outputs. These literacies move beyond technical proficiency to encompass ethical reasoning, critical evaluation, transparency and contextual judgement—skills that are essential to ensuring that GenAI supports, rather than undermines, academic integrity. This aspect of the framework informs the analysis of reflection tasks, usage declarations and classroom-based scaffolding strategies aimed at building comprehensive GenAI literacy.

To ensure that GenAI-enhanced learning remains meaningful and theoretically grounded, the study also employs CLT (Bada, 2015; Hein, 1991) and Bloom's (1956) taxonomy. CLT emphasises that knowledge is actively constructed through experience, inquiry and reflection, while Bloom's taxonomy provides a structured hierarchy of cognitive process ranging from remembering and understanding to analysing, evaluating and creating, that is instrumental in designing scaffolded GenAI integrated activities. These frameworks collectively emphasise that knowledge is actively constructed through experience, inquiry and reflection, providing a foundation for the design and interpretation of learning activities in the study. The relationship between these frameworks and their collective contribution to the study's pedagogical model is illustrated in Figure 1.

Although these frameworks share common concerns with ethics, reflection and learner agency, they are not redundant. Rather, they contribute distinct but complementary dimensions: CDP (Masood & Haque, 2021) provides a values-based and critical orientation; digital and AI literacies emphasise operational skills, evaluative practices and ethical engagement; CLT (Bada, 2015; Hein, 1991) positions learning as an active, student-centred process; and Bloom's (1956) taxonomy offers a structured cognitive scaffold for progression. Their integration enables the model to address these dimensions collectively, forming a

coherent rationale where philosophical grounding (why), practical capability (how), pedagogical process (what) and cognitive progression (to what extent) converge to ensure GenAI integration is ethically principled, instructionally sound and developmentally scaffolded.

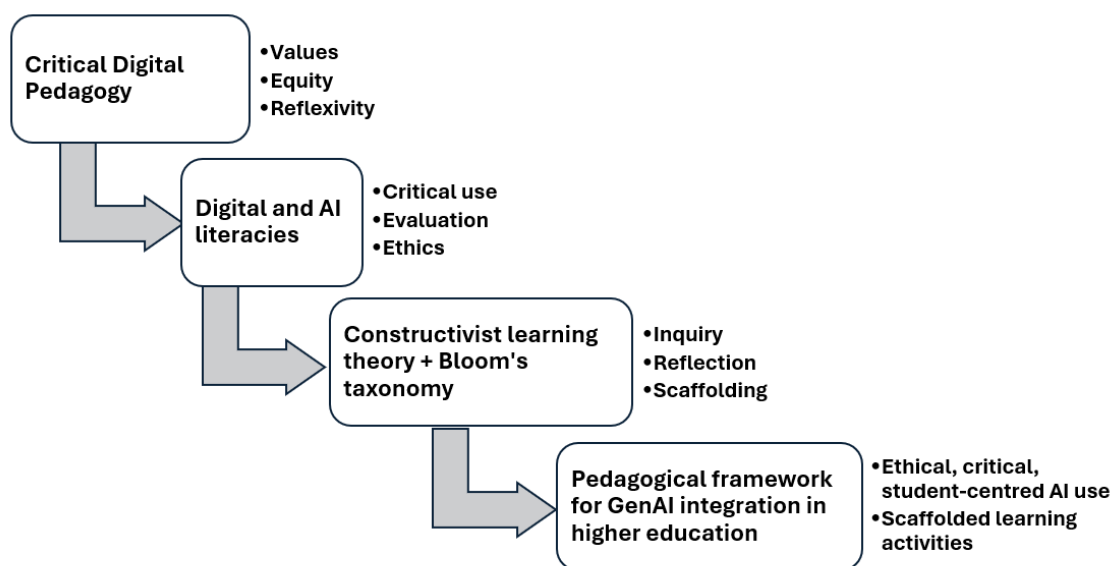


Figure 1. Conceptual framework for integrating GenAI into higher education classrooms

Methods

Research design

This study adopted an exploratory case study design (Yin, 2018) to investigate the ways in which the teaching team is currently embedding GenAI into postgraduate ICT instructions. The purpose was not to measure learning outcomes in a quantitative sense, but to generate practice-based insights into the pedagogical processes, challenges and opportunities associated with GenAI integration. The design privileges depth and contextual richness over generalisability, aligning with the study's focus on theory-informed pedagogical experimentation. Ethics approval was obtained from the relevant university Human Research Ethics Committees.

Instructional design

The instructional interventions were designed by the research team and were guided by the composite framework combining CDP (Masood & Haque, 2021), digital and AI literacies, CLT (Bada, 2015; Hein, 1991) and Bloom's (1956) taxonomy. Case study 1 embedded a GenAI usage declaration template into weekly assessed tasks to scaffold ethical engagement and transparency. Case study 2 implemented a five-step scaffolded activity during tutorials, encouraging students to use GenAI for idea generation, critique and revision, culminating in reflective peer sharing. Both designs aligned with institutional integrity policies and aimed to foster critical and ethical engagement with GenAI.

Participants

The study involved postgraduate ICT students enrolled in core first-year units. Case study 1 consisted of 280 students in an information technology subject delivered on a single campus (97% international, 86% in their first semester), while case study 2 consisted of 185 students in an information systems analysis

and design subject delivered across multiple campuses, with similarly internationalised cohorts. These cases were purposively selected as early examples of formal GenAI integration in large, diverse classes.

Case selection and representativeness

The two cases were chosen to highlight both convergences and contrasts in GenAI adoption. While both involved internationalised postgraduate ICT cohorts, they differed in scale, subject structure and institutional context. The cases are not intended to be statistically representative but provide analytically rich insights into how GenAI integration is shaped by institutional policies, student demographics and instructional design choices.

Data collection

Data were drawn from multiple sources to illustrate how students and staff engaged with GenAI in practice:

- Student reflections and usage templates provided accounts of how GenAI was applied and critiqued.
- Diagnostic and follow-up surveys (weeks 1 and 9) offered descriptive snapshots of confidence and literacy.
- Classroom discussions, online forums and instructor reflections contextualised peer learning and pedagogical challenges.

Data analysis

Qualitative data were thematically reviewed, guided by the composite pedagogical framework. Patterns of ethical awareness, transparency, critical evaluation and scaffolded learning were identified across cases. Survey data were used descriptively to contextualise these patterns rather than as systematic pre/post measures.

Scope and limitations

The study was designed to capture pedagogical processes rather than measure outcomes. Its contribution lies in offering theoretically grounded insights into how institutional policies are translated into classroom practice. Future research could extend this work through larger-scale or mixed-method designs to examine longitudinal impact and cross-disciplinary transferability.

Educators on the ground: kinds of pedagogical strategies and scaffolding approaches that are used in promoting critical, ethical and transparent use of GenAI in classroom

The case studies focused on the 2024 offering of the subject, during which significant curriculum adjustments were made to incorporate GenAI considerations, particularly in relation to promoting academic integrity and critical digital literacy. Faculty policy permitted the use of tools such as Microsoft Copilot for background research and self-directed learning but made clear that the submission of AI-generated content as original work constituted academic misconduct. This dual positioning encouraged GenAI as a learning aid while enforcing firm boundaries established a critical pedagogical foundation for promoting students' AI literacy alongside ethical engagement.

Case study 1

Context and rationale

This case study operationalises CDP's (Masood & Haque, 2021) emphasis on equity and reflexivity by embedding transparent GenAI usage templates, while also drawing on CLT (Bada, 2015; Hein, 1991) and Bloom's (1956) taxonomy to scaffold students' progression from initial experimentation to higher-order critical evaluation. This case study is situated within a large postgraduate information technology

subject offered by an Australian university, comprising over 280 students. The subject is delivered through a combination of weekly lectures and tutorials and is structured around the application of real-life problems and case studies. A key feature of the subject design is the integration of 10 weekly, assessed class discussions, aimed at fostering continuous student engagement and promoting formative learning.

The teaching team aimed to scaffold student interactions with GenAI through activities aligned with established teaching and learning principles, including constructive alignment, transparency and authentic assessment (Loughlin et al., 2021; Xu & Brown, 2016). Central to this approach was a GenAI usage template, embedded into weekly submissions, which required students to identify the tool used, describe its purpose, provide appropriate citation, upload relevant transcripts or screenshots and offer a reflective commentary.

Teaching and learning framework: Scaffolding ethical GenAI use

In the opening week of the semester, students were presented with clear guidelines regarding the appropriate use of GenAI tools, communicated via the learning management system (LMS) and the subject outline. A week 1 diagnostic survey revealed that while most students had experimented with GenAI tools, 56% self-identified as beginners and were unsure of usage boundaries. This uncertainty was echoed in student reflections, particularly among those new to academic study in Australia. One student shared:

In the beginning of the semester, I had no clue on how to use the different Generative AI tools academically. After having provided the assignment template and referencing library from the university, I was able to perform better and influence my academic work much better whenever and wherever GenAI tool was used in my tutorials. (Student)

To address this knowledge gap, a GenAI usage declaration template was introduced in week 2. The template included a mandatory integrity declaration, referencing guidance aligned with institutional policies and sample citations following institution referencing style. By standardising expectations, the template reduced ambiguity and supported students in navigating ethical usage (Lameras, & Arnab, 2022). It also promoted transparency and uniformity across the cohort, facilitating consistent instructor feedback and reinforcing integrity-focused practices.

Guided application: Structured support and template usage

Students were encouraged to utilise GenAI tools (e.g., Microsoft Copilot) for ideation, language refinement and draft review. Each instance of use had to be clearly documented in the template, which included sections for tool identification, self-reflection and referencing.

This structured documentation served multiple pedagogical purposes. Firstly, it provided novice users with a scaffolded entry into GenAI-assisted learning. Secondly, it ensured equity in assessment by holding all students accountable to the same documentation standards. Finally, it gave educators a clear view of how GenAI was being used and the extent to which students were engaging critically with these tools.

Critical reflection: Building ethical awareness and digital literacy

Each weekly submission required students to critically evaluate GenAI outputs for accuracy, relevance and appropriateness. This reflective component aligned with higher-order cognitive skills in Bloom's (1956) taxonomy particularly analysis and evaluation. Over time, students began to recognise common limitations of GenAI, including hallucinations, overly generic responses and occasional factual inaccuracies. By mid-semester, classroom discussions had matured to include peer critiques of AI-generated suggestions, often highlighting bias or lack of nuance. This reflects recent findings by Lee et al. (2025), who note that GenAI use can reduce cognitive effort and lead to misplaced confidence in AI outputs, underscoring the need for structured reflection and critical engagement in educational settings.

This iterative process not only strengthened students' digital literacy but also cultivated an ethical awareness of GenAI's role in academic work. Many students reported a shift in mindset: from passively accepting GenAI outputs to actively scrutinising them. One student reflected:

The use of the template and declaring the use of GenAI has helped me reflect on how I use GenAI in my academic work and the importance of declaring to show transparency of my work. Being able to use GenAI in the weekly tutorials has also made it possible for me to explore the use of GenAI in my academic work and brainstorming. (Student)

This critical engagement helped them appreciate the importance of human oversight in scholarly contexts and highlighted how pedagogical tools such as the template enabled meaningful reflection, transparency and growth.

Feedback and iterative development: Building confidence and integrity

Ongoing formative feedback via weekly submissions facilitated a continuous learning loop. A week 9 follow-up survey indicated that 32% of students had significantly improved their AI literacy, while 29% reported feeling confident in ethically navigating GenAI tools. Authentic assessment practices such as the submission of transcripts, citation records and justifications supported the development of metacognitive skills. Students became increasingly self-aware of their learning processes and more adept at articulating their reasoning. This developmental trajectory is exemplified by one student who reflected on their early challenges and growth:

After submitting my assignment in the first week, I was docked points for formatting and for using GenAI incorrectly. But the great thing is that after the tutor gave me the template in the second week, I gradually learned how to use GenAI to help me complete the assignment. It helped me to improve my GenAI literacy and set clear expectations for my learning. (Student)

Peer dialogue and iterative instructor feedback further reinforced the message that GenAI is a support tool, not a substitute for critical thinking or academic authorship. The requirement to include transcripts and screenshots as appendices embedded academic integrity into students' workflows in a practical, demonstrable way.

Case study 2

Context and rationale

This case illustrates the integration of digital and GenAI literacies with CLT (Bada, 2015; Hein, 1991) and Bloom's (1956) taxonomy, positioning GenAI as a tool for inquiry and validation, and scaffolding tasks from prompt-based exploration toward analysis, evaluation and peer reflection. This case study focuses on a first-year postgraduate core subject in information systems analysis and design, with 185 enrolled students at a multi-campus Australian university. The majority of the cohorts were international students, many of whom are experiencing study in Australia for the first time. This subject is delivered over a 12-week period and includes two hours of lectures and two hours of tutorials each week. The assessments are structured in alignment with the Artificial Intelligence Assessment Scale (AIAS) (Perkins et al., 2024), incorporating principles of AI collaboration. The GenAI exercises were designed and were conducted during the tutorial time. The exercises were aimed to empower students to become informed, ethical and confident users of GenAI, aligning its use with deep learning and academic integrity.

Teaching and learning framework: Scaffolding ethical AI use

The teaching and learning framework for case study 2 positioned GenAI as a supportive tool for learning rather than a replacement for human judgement and critical thinking. Students were encouraged to

view GenAI as a starting point for inquiry, enabling idea generation and exploration, while maintaining responsibility for validating and contextualising outputs. By embedding structured GenAI activities into classroom practices and assessments, the framework cultivated students' confidence in using GenAI ethically, fostered academic honesty and strengthened critical thinking and digital GenAI literacy skills essential for real-world professional environments.

Guided application: Structured support and template usage

In this exercise, students were asked to use GenAI tools that are freely available such as ChatGPT 3.0, or the university's enterprise edition of Microsoft Copilot. This dual-access approach enabled inclusivity while also raising important pedagogical points about the different contexts in which GenAI tools operate, that is, public versus institutionally managed tools. Before commencing the activities, students were explicitly briefed on critical issues related to GenAI system design, including data security, bias and ethical considerations, misinformation and hallucination.

The exercise given to students was case study based, designed at Bloom's Levels 2, 4 and 5. These levels correspond to learning tasks where students are required to explain ideas or concepts (Level 2: understand), draw connections among ideas (Level 4: analyse) and justify a stance or decision (Level 5: evaluate). The type of learning required was investigative. The objective of this entire exercise was that students:

- Feel more confident using GenAI effectively.
- Understand that GenAI is a starting point, not the final authority.
- Develop critical thinking and digital GenAI literacy skills.

The exercise was divided into five scaffolded steps:

- Initial prompting: In this step, students were required to use GenAI to generate system requirements based on the provided scenario. Students were encouraged to experiment with various prompt styles, including role-based and diagram generating prompts.
- Validating and refinement: In this step, students were asked to critically assess the GenAI outputs, identifying accurate insights, vague terminology, missing elements and unrealistic assumptions.
- Student-centred revision: In this step, students were asked to rewrite or refine the requirements based on the critique, classroom learning, resources found on Google and/or learning resources provided during lectures on the LMS.
- Reflection: In this step, students were asked to reflect on what GenAI did well, what is missed and whether they would use GenAI in a real professional context.
- Peer sharing: In this step, students were asked to post reflections to the discussion forum to promote peer learning.

Critical reflection: Building ethical awareness and digital literacy

Students initially responded with enthusiasm to the open-ended prompting phase, appreciating the speed and structure GenAI tools brought to a traditionally iterative and hypothetical process. However, the exercise revealed varying levels of GenAI expertise, with some students writing overly simple prompts that produced generic outputs, while others advanced to more sophisticated prompts such as specifying stakeholder roles and generating visual representations. This variance highlighted the importance of critical reflection in building both ethical awareness and digital literacy, as students learned to move beyond surface-level use and engage thoughtfully with GenAI outputs.

Feedback and iterative development: Building confidence and integrity

Students with an understanding of the context and the ability to use GenAI were able to refine their queries and elicit more structured, contextually relevant outputs. Students were required to spend time filtering and reshaping outputs, which was a valuable skill-building exercise, but also introduced cognitive load that distracted from the core learning goals if not well supported. Requests for diagram generation, while pedagogically useful, introduced technical issues. Enterprise tools like Microsoft

Copilot offered limited formatting for visuals. However, students using ChatGPT could generate diagrams with greater flexibility.

Peer learning and ethical growth: Shared evaluation strategies and reflection

The evaluation phase is the most crucial, as it is where students identify issues such as misrepresentation and vague terminologies used in the GenAI-generated content. This moved the cognitive task from surface-level generation (aligned with Bloom's Level 2: understanding) to higher-order thinking tasks such as analysing (Level 4) and evaluating (Level 5). Students were explicitly instructed to look for plausible sounding but factually incorrect or misleading information, which is a common trait of GenAI often termed "hallucinations". This critical engagement was where the learning became transformative. Students began to realise that although GenAI-generated text can be sound, authoritative and complete, it may not be valid, contextually appropriate, or technically sound. This process helped build GenAI literacy by empowering students to see themselves as evaluators and editors of machine-generated content rather than passive consumers. This also leads to a behavioural change toward using GenAI responsibly and ethically. The validation phase served as a corrective anchor, reconnecting students to the original purpose of the exercise: to design context-sensitive system requirements based on the provided needs and technical constraints, not just to produce impressive-looking output.

Following the evaluation of GenAI outputs, students were required to rewrite the system requirements based on their own critical observations from the validation phase, concepts taught during lectures, learning resources shared via the institutional LMS (Moodle) and independent research, including reputable resources found via Google. This phase promoted active knowledge construction, reinforcing the principle that system design is not a simple cut-and-paste exercise but rather a context-sensitive, iterative process of interpretation and improvement. Students engaged in higher order cognitive tasks such as synthesising multiple inputs, making informed design decisions and justifying trade-offs between functional clarity and stakeholders' needs in a dynamic environment, which GenAI is not yet capable of. The exercise provided a compelling case for how GenAI can be used for brainstorming ideas and as a productivity enhancer. By rewriting the requirements in their own words and justifying their choices, students exhibited increased confidence in their analytical judgement and design thinking capabilities.

Theory-to-practice alignment in the pedagogical use of GenAI

Table 2 illustrates the alignment between the theoretical frameworks discussed earlier and their practical application within classroom activities across both case studies, highlighting the role of CDP (Masood & Haque, 2021), digital and GenAI literacies and CLT (Bada, 2015; Hein, 1991), including Blooms (1956) taxonomy, in guiding GenAI integration.

Table 2

Theory-to-practice alignment in the pedagogical use of GenAI

Theoretical framework	Key concepts case study 1	Application in classroom (case study 1, 185 students)	Key concepts case study 2	Application in classroom (case study 2, 280 students)
Critical digital pedagogy (CDP)	Ethics, critical reflection, student ownership of knowledge creation.	Students were encouraged to reflect on the role of GenAI, identify its limitations and use it as a tool rather than an authority. Ethical use and student	Equity, ethics, transparency, student empowerment	Standardised templates and integrity declarations fostered ethical awareness and agency, Students explored GenAI under structured,

		empowerment were emphasised.		inclusive and transparent guidelines respecting diverse cultural contexts.
Digital & GenAI literacy	GenAI understanding, ethical usage, critical evaluation, transparency	Scaffolded steps helped students engage critically with GenAI outputs, reflect on GenAI reliability and cite or challenge GenAI generated content building GenAI literacy.	GenAI tool literacy, ethical usage, reflection, bias awareness	Students documented GenAI use and critically reflected on outputs.
Constructivist learning theory (CLT) & Blooms taxonomy	Active learning, scaffolding, higher-order thinking (Bloom's Levels 2, 4 and 5)	Exercises scaffolded from usage to reflection aligned with Bloom's taxonomy: understanding (prompting), analysing (validation) and evaluating (rewriting and reflection), supporting iterative knowledge construction and design thinking.	Scaffolded learning, metacognition, higher-order thinking (analysis)	Tasks scaffolded from usage to reflection aligned with Bloom's taxonomy.

Building on the theory-to-practice alignment identified across the two case studies, an emergent pedagogical model was developed. Figure 2 presents the emergent model of ethical GenAI-powered constructivist pedagogy, synthesising the convergence of CDP (Masood & Haque, 2021), digital and GenAI literacies, CLT (Bada, 2015; Hein, 1991) and Bloom's (1956) taxonomy. This model highlights the interconnected roles of ethics, critical engagement, higher-order thinking and scaffolded learning in the design of GenAI-integrated learning environments. It provides a conceptual foundation for operationalising GenAI use in a manner that promotes both academic integrity and learner empowerment.

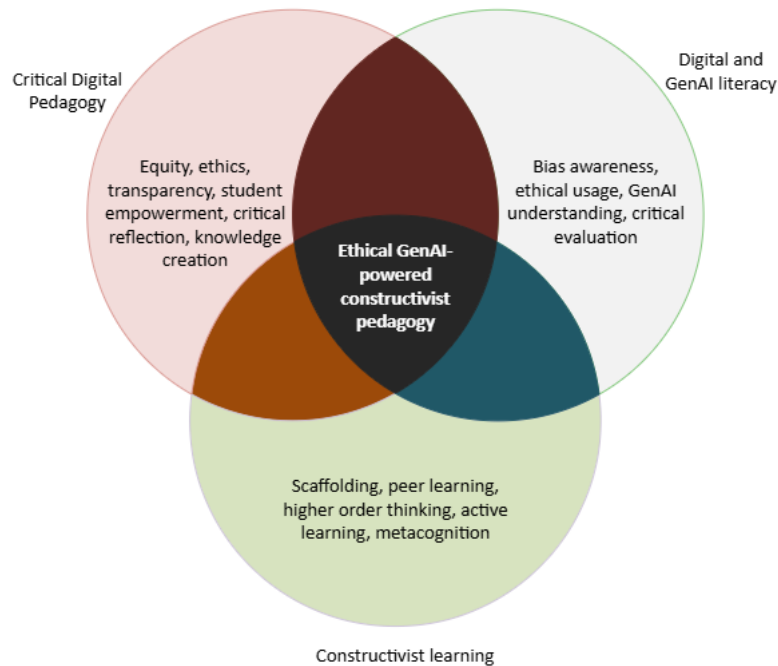


Figure 2. Emergent model of ethical AI-powered constructivist pedagogy

Figure 3 presents the teaching and learning framework developed from this study and guided by CDP (Masood & Haque, 2021), digital and GenAI literacies and CLT (Bada, 2015; Hein, 1991) including Bloom's (1956) taxonomy. This process framework outlines key stages in the ethical integration of GenAI into the learning process, including initial orientation, guided application, critical reflection, feedback-driven iterative development and peer learning. It highlights specific opportunities for meaningfully GenAI engagement, while also identifying stages requiring limited or cautious use to preserve academic integrity and promote human judgement.

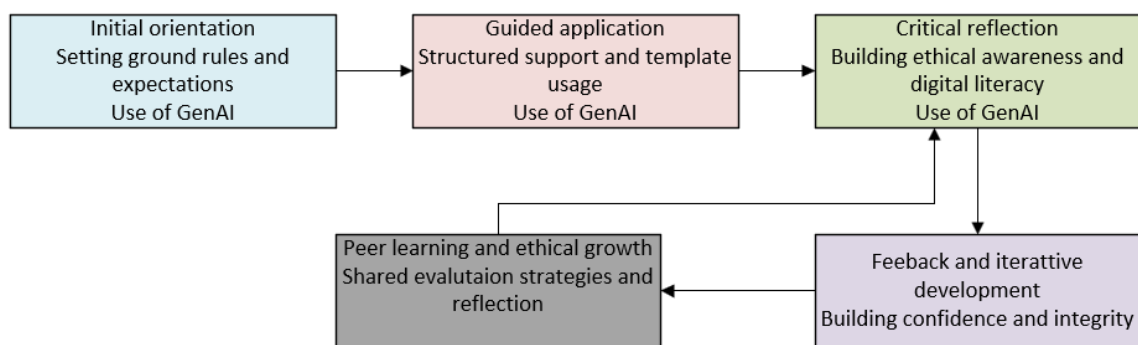


Figure 3. Teaching and learning framework guided by CDP (Masood & Haque, 2021), digital and GenAI literacies and CLT (Bada, 2015; Hein, 1991), including Bloom's (1956) taxonomy

Pedagogical concern: Balancing engagement and learning

Both case studies demonstrated substantial gains in students' confidence and technical proficiency with GenAI tools. Students showed increasing autonomy in prompt engineering, critical evaluation of GenAI outputs and awareness of how GenAI could support their learning processes. However, these benefits

were accompanied by emerging pedagogical tensions. In case study 1, the first-year postgraduate core subject, students with varying levels of AI literacy necessitated differentiated support, leading to inconsistent levels of engagement and critical thinking across the cohort. Similarly, in case study 2, also a core first-year postgraduate subject at another university, the allure of GenAI's capabilities diverted students' attention from core disciplinary content, such as requirement elicitation and system thinking.

These cases highlight a broader instructional challenge: how to sustain students' enthusiasm for GenAI while ensuring strong alignment with intended learning outcomes. Activities aligned with Bloom's (1956) taxonomy particularly those targeting understanding, analysing and evaluating proved effective for scaffolding critical engagement. However, they also required constant pedagogical redirection to prevent superficial use of GenAI from replacing deeper cognitive engagement and disciplinary learning.

Ethical concern: Fostering integrity without policing

Ethical engagement with GenAI emerged as a shared priority across both case studies. Transparency tools such as usage template, academic integrity declarations and reflective components were embedded into assessment design to promote critical and responsible GenAI use. Over time, students progressed from passive consumption of GenAI outputs to more thoughtful critique, particularly in identifying hallucinations, bias and overgeneralisation.

However, the burden of upholding academic integrity largely fell on individual educators. Teachers increasingly assumed quasi-policing roles, including verifying citations, interpreting ambiguous GenAI use cases and adjudicating potential misconduct incidents—all of which detracted from their core instructional responsibilities. This shift not only increased educators' cognitive and emotional labour but also strained student-teacher trust, as integrity checks were sometimes perceived by students as punitive rather than supportive or educative. These ethical tensions demand the urgent need for institutionally supported frameworks that balance accountability with developmental support, ensuring that the promotion of academic integrity remains an educative, not punitive, process.

Answering RQ1: Pedagogical strategies combined critical reflection, scaffolded documentation, peer collaboration and cognitive progression to embed ethical GenAI use within authentic learning tasks. The approach transformed AI literacy from a technical skill to a critical, ethical and reflective educational practice.

Answering RQ2: Educators encountered pedagogical, ethical and logistical challenges from uneven student readiness and increased workload to institutional policy gaps. Yet, these were balanced by opportunities to enhance AI literacy, critical thinking and authentic learning. This illustrates that when scaffolded ethically and pedagogically, GenAI can be a catalyst for transformative, integrity-driven education.

Recommendations for whole-of-institution practice

To integrate GenAI ethically and sustainably into higher education, institutions must adopt a systemic, cross-functional approach. As highlighted by TEQSA (2024), Jisc (2024) and the American Association of Colleges and Universities (Watson & Rainie, 2025), GenAI literacy is increasingly central to academic integrity, curriculum design and graduate capability development. The following recommendations offer a strategic, policy-aligned framework for embedding GenAI use across teaching, learning and assessment.

Distributed academic integrity responsibility

Embedding academic integrity in the context of GenAI requires a move away from siloed, instructor-led enforcement toward a more sustainable, distributed model of responsibility. As TEQSA emphasises, building a culture of integrity in the age of artificial intelligence demands that multiple actors across the institution work in concert to promote consistent, ethical engagement with AI tools.

A distributed approach entails the active involvement of all student-facing roles. Tutors and teaching assistants, who engage regularly with students, are well-positioned to reinforce GenAI expectations during tutorials and provide real-time feedback on usage. Academic advisors play a complementary role by supporting students' ethical decision-making and helping them understand how GenAI usage fits within their broader academic development and professional goals. Meanwhile, learning technologists and instructional designers are essential for embedding GenAI guidelines, documentation tools and policy-aligned workflows into subject design and LMS environments. Library and academic skills staff can further support this model by offering workshops, drop-in sessions and one-on-one consultations that focus specifically on GenAI literacy, citation practices and responsible tool use.

Centralised GenAI literacy resources

To ensure equitable access and consistent guidance, institutions should centralise the development of GenAI literacy resources through an integrated support model. A centralised repository of tools, templates and learning materials can significantly enhance students' ability to navigate GenAI responsibly and with confidence. One key strategy is to develop interactive modules that introduce students to GenAI tools while also addressing potential risks such as hallucinations, embedded bias and over generalised responses. These modules should also provide actionable guidance on when and how AI use is appropriate in academic work, helping students distinguish between ethical support and academic misconduct.

In parallel, institutions should create quick-reference guides and annotated examples to support students in areas such as correct citation of AI-generated content, writing reflective commentaries and avoiding common missteps. These resources can be embedded within subject sites, digital learning platforms and library pages to ensure accessibility. These initiatives provide early evidence of how targeted, accessible resources can scaffold responsible AI use across diverse student cohorts. To further support students throughout their academic journey, universities are also encouraged to establish an AI literacy hub either digital or physical within the library or academic learning centre. This hub should provide access to curated resources, including citation templates, video tutorials, case studies and support channels for both self-paced learning and one-on-one consultations.

Template standardisation across programmes

Standardising the documentation of GenAI use across programmes is essential to promoting academic transparency and normalising responsible engagement with GenAI tools. One effective strategy is to embed a faculty-wide GenAI declaration template into all LMS subject sites. This template should include clearly defined fields for students to indicate the name of the GenAI tool used, describe its purpose, provide citations in line with institutional guidelines and upload supporting documentation such as transcripts or screenshots. A section for reflective commentary should also be included to encourage critical engagement with the AI tool's output.

To ensure clarity and institutional alignment, the template should be closely aligned with existing referencing policies and academic misconduct procedures, helping students understand the connection between transparent GenAI use and their academic responsibilities. Embedding this structure within each subject ensures that integrity expectations are explicit and consistent, rather than dependent on individual instructors' discretion. At the same time, flexibility remains important to accommodate disciplinary differences. Institutions should therefore provide editable versions of the template, enabling subject coordinators to adapt prompts or requirements based on their specific assessment types or pedagogical goals, while maintaining the core principles of ethical use and accountability.

Assessment alignment and pedagogical flexibility

As GenAI tools become more accessible and sophisticated, assessment design must evolve to reflect a balance between technological integration and the preservation of human academic judgement. Rather than defaulting to prohibition or avoidance, institutions should reframe assessment design to emphasise

both process and product. This involves encouraging students to document their workflow detailing how GenAI tools were used during ideation, drafting, or review and to reflect critically on the choices made and their alignment with academic integrity principles.

Rubrics should be adapted to assess not only the quality of final outputs but also students' capacity to interpret, evaluate and ethically integrate AI-generated content. Embedding these criteria into assessment standards reinforces a shift from passive AI use to active, critical engagement. Furthermore, educators are encouraged to design tiered assessment tasks, where the use of GenAI may be permitted or encouraged during specific stages (e.g., brainstorming or refining academic language), but restricted or discouraged in others (e.g., final synthesis, argument construction, or personal reflection). This nuanced approach maintains clarity while acknowledging the real-world potential of GenAI tools.

Graduate attribute development: Positioning GenAI literacy as a core competency

As GenAI tools continue to reshape knowledge production, communication and professional practice, GenAI literacy must be recognised as a foundational graduate capability. Institutions should embed GenAI literacy outcomes into subject-level learning objectives, curriculum maps and programme-wide capabilities, ensuring that students are not only introduced to the technical functions of GenAI (such as prompt engineering and output evaluation) but are also equipped to navigate the ethical, social and disciplinary implications of its use. These outcomes should be integrated across both core and elective subjects, with a clear progression of skills and ethical understanding over time.

To further support this positioning, universities should incorporate GenAI literacy into their graduate attribute frameworks, ensuring that ethical GenAI engagement is viewed as an integral part of academic and professional identity. These frameworks should be visible in course outlines, student handbooks and employability narratives, creating alignment between academic values and industry expectations. Embedding GenAI competencies in this way reinforces their relevance to students' future careers and supports meaningful industry engagement.

Conclusions, recommendations and future research

The integration of GenAI in Australian higher education classrooms presents both promising opportunities and complex challenges. This study demonstrates that while institutions have developed policies to manage ethical GenAI use, the translation of these frameworks into everyday teaching practices remains inconsistent.

Educators frequently shoulder the burden of interpreting broad policies and designing pedagogically sound, ethical approaches for GenAI integration. However, when GenAI use is scaffolded effectively, it fosters not only GenAI literacy but also ethical awareness, critical thinking and deeper engagement in knowledge creation. Guided by a composite pedagogical framework grounded in CDP (Masood & Haque, 2021), GenAI digital literacy and CLT (Bada, 2015; Hein, 1991), educators were able to foster not only GenAI literacy but also ethical alignment, critical thinking and student empowerment.

The teaching and learning framework developed through this study bridges theory and practice by providing a structured approach to GenAI use in classrooms. Key components include the use of transparency templates, scaffolded reflection activities, prompt engineering strategies, critical validation tasks and peer learning mechanisms. To operationalise GenAI policies effectively and create cohesive learning experiences, higher education institutions should consider the following strategic actions:

- Introduce GenAI documentation practices by introducing usage templates across LMS platforms. These should ensure consistent ethical reflection, citation guidance and transparency in AI engagement across all units/subjects.

- Embed GenAI literacy across curricula by integrating technical, critical and ethical GenAI competencies into course-level learning outcomes and graduate attribute frameworks, rather than relying on isolated workshops.
- Redesign assessment strategies to focus on learning processes where GenAI may play a supporting role, while preserving human judgment, originality and critical synthesis as central learning objectives.
- Foster cross-functional collaboration between academic departments, information technology teams, library services and accreditation bodies to develop cohesive, consistent and institution-wide practices for GenAI integration.
- Institutionalise ongoing professional development by embedding GenAI ethics, pedagogy and technical skills into staff training programmes, ensuring that support extends beyond early adopters or innovators to all teaching personnel.

While this study provides valuable insights, its findings are situated within the Australian higher education context. The case studies focus on ICT disciplines in metropolitan universities with predominantly international student cohorts, shaped by TEQSA's (2024) policy and integrity frameworks. These contextual factors may limit direct transferability to other systems. However, the pedagogical strategies highlighted such as scaffolded reflection, transparency templates and distributed responsibility for AI literacy offer lessons with broader relevance. Future research should explore how these approaches translate internationally, accounting for variations in governance, funding and cultural expectations of academic integrity across different higher education settings.

Author contributions

Meena Jha: Conceptualisation, Investigation, Writing - original draft, Writing - review and editing; **Amara Atif:** Data curation, Investigation, Formal analysis, Writing - review and editing.

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Corresponding author: Meena Jha, m.jha@cqu.edu.au

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Please cite as: Jha, M., & Atif, A. (2025). Reimagining pedagogy for the GenAI era: Frameworks, challenges and institutional strategies. *Australasian Journal of Educational Technology*, 41(5), 56–73. <https://doi.org/10.14742/ajet.10645>