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Use of Generative AI in the Australian Engineering Curriculum – the academics' perspective

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ABSTRACT

CONTEXT

The integration of Generative AI (GenAI) in higher education has become a pivotal area of discussion as institutions strive to balance innovation with academic integrity. While GenAI offers transformative potential for learning and assessment, its rapid adoption has highlighted challenges of ensuring consistent and ethical use across diverse disciplines. Existing research indicates that universities have struggled with the implementation of clear policies regarding GenAI.

PURPOSE OR GOAL

This study investigates academic perspectives of how GenAI is being addressed in engineering course outlines. The goal is to understand how the institutional policies on use of GenAI are being implemented, the consistency of messaging to students across the curriculum, and the students' feedback academics are getting. Specifically, this paper seeks to assess the degree of coherence across institutions and identify the barriers to effective GenAI integration aligned with academic integrity and education outcomes.

APPROACH OR METHODOLOGY/METHODS

An autoethnographic qualitative survey was conducted with 12 engineering academic staff from ten Australian higher education institutions, exploring three themes: policy governance, template standardisation, and student feedback. Thematic analysis identified patterns, variations and insights in how GenAI is framed within course outlines and assessment tasks.

ACTUAL OR ANTICIPATED OUTCOMES

The study reveals significant variation in how GenAI is implemented across institutions, particularly in terms of governance structures and academic autonomy. Findings highlight inconsistencies in how GenAI is communicated to students and how academic staff are supported with training, and how they perceive their roles in enforcing GenAI guidelines.

CONCLUSIONS/RECOMMENDATIONS/SUMMARY

The findings suggest that while GenAI is widely adopted across Australian engineering institutions, the absence of consistent and clear policies has led to confusion among students and variability in academic practices. The study underscores the need for a more standardised and transparent approach to GenAI integration, particularly in the context of course outlines and assessments. Recommendations include implementing consistently clearer frameworks for GenAI use, providing more structured support for staff, and aligning institutional policies with pedagogical practices.

KEYWORDS

Generative AI, Engineering education, Academic integrity, Australian universities

Introduction

The release of ChatGPT-3.5, a generative AI (GenAI) tool, started many debates in higher education about its impact on academic integrity and the need to rethink the approach to teaching and learning (Cotton et al., 2023). A recent systematic literature review by Nikolic et. Al (2024) highlighted that universities have struggled to keep pace with the rapid evolution of GenAI, with staff facing challenges in adapting to change, policy direction unclear, and training and support often insufficient. In Australia, the national regulatory body Tertiary Education Quality and Standards Agency (TEQSA), published insights on how higher education institutions were planning to address the risks GenAI pose (TEQSA, 2024), and has recently released a report to guide the implementation (TEQSA, 2025). With action plans put in place, Australian higher education institutions are reviewing their policies at an institutional level. While universities provide broad frameworks, implementation often falls to individual instructors, leading to variability across assignments and courses (Perkins et al., 2024). This paper focuses on the practical implementation at the unit of study level and explores how the use of GenAI is addressed in the outlines provided to students, to uncover whether there are tensions between institutional policies and academic autonomy. This is explored through the perspective of academics.

Drawing on a six-question survey of 10 Australian universities, this study investigates themes including policy governance, template standardisation, and student feedback. The design is used to answer the research question 'How are institutional policies on the use of GenAI and messaging to students being implemented in engineering course outlines, and what has been the feedback students have shared with academics?'

Method

This study adopted an autoethnographic qualitative survey research method, chosen to explore the authors' perceptions and experiences. Surveying academic staff was identified as the most effective approach to investigate how Australian higher education institutions address GenAI through policies, and how these policies are implemented by academics in course outlines. Research suggests that there are major differences in communication of GenAI policy to students via course outlines (Nikolic et. Al., 2025), and that exploring this gap is of value to the broader community.

While universities establish broad, institution-wide policies on GenAI, the responsibility for implementing these guidelines falls to individual instructors and subject coordinators. Surveying academic staff therefore provides direct insight into the practical implementation of institutional policies, revealing the tensions central to this study's research goals. Based on this rationale, the 12 academic staff who co-author this study, from engineering faculties across ten diverse Australian higher education institutions, with a particular focus on engineering education, came together to describe their experience. The participating institutions included Southern Cross University (SCU), University of Canberra (UC), La Trobe University (LTU), University of Melbourne (UoM), University of Wollongong (UOW), University of the Sunshine Coast (UniSC), Polytechnic Institute Australia (PIA), University of Queensland (UQ), Monash University (MU), and University of Technology Sydney (UTS).

A six-question qualitative survey was developed as the empirical data collection instrument. Its design was informed by a review of relevant literature and grounded in established scholarship. To ensure validity and methodological rigor, the survey questions were reviewed by academic peers with expertise in engineering education and curriculum design. The questions were carefully structured to address the research questions:

- *RQ1: How are institutional policies on the use of GenAI being implemented in the engineering units of study outlines?*
- *RQ2: How the institutional policies on the use of GenAI are communicated to students in the units of study outlines?*

- *RQ3: What has been the feedback students have shared with academics and how it has influenced outline revisions?*

The final survey was comprised of six questions:

1) In what ways, if any, has your school revised its engineering course outlines to address generative AI? Please describe specific changes or the reasons for making none.
2) Where do the main decision-making levers sit for wording about generative AI in course outlines (e.g., whole-of-university policy, faculty-level guidelines, individual academics)? How does that governance structure help or hinder you?
3) To what extent is the information about generative AI in course outlines written specifically for each course, versus copied from a standard university or faculty template? Can you share any examples of how it's been adapted or not for your course(s)?
4) How is generative AI framed for students in your outlines? Principally as an academic-integrity risk, as a learning tool, or something else? What language choices communicate that stance?
5) Looking across the engineering curriculum, how coherent is the overall message about generative AI? Where do you see alignment or contradictions that matter for students?
6) What feedback (formal or informal) have you received from students about the AI sections of your outlines? How has that feedback influenced subsequent revisions?

The collected responses were analysed using thematic analysis to gain insights into the current landscape of GenAI integration in Australian engineering higher education. This analytical method was chosen because it is particularly well-suited for identifying, analysing, and reporting patterns within qualitative data, making it ideal for exploring the perceptions and experiences of the academic staff members surveyed. An inductive approach was used, allowing themes to emerge directly from the participants' responses (Braun & Clarke, 2022). To ensure the analytical rigor, validity, and reliability of the findings, the initial coding of the data was performed by one researcher and subsequently reviewed by other members of the research team.

Findings

The findings from the survey conducted with academic staff from across the ten universities are organised around four main themes: the integration of GenAI into teaching, governance structures for GenAI policies, the provision of support and training for staff, and academic perspectives of the student experience. Each theme offers insights into the ways GenAI is being incorporated, the impact of institutional governance on its application, and the challenges that arise from inconsistency in policy and communication.

Theme 1: Everybody's doing it, and for the right reasons

The responses to the survey universally indicated that GenAI was being incorporated in the teaching environments at their institutions, noting that the survey sample is inherently biased in this regard. Two of the respondents noted that the adoption of GenAI was being incorporated into a larger curriculum design initiative as part of their institution's curriculum development and/or renewal processes.

The majority of respondents indicated that GenAI is seen as a learning tool for their students, although some noted that this is only a recent development in how these tools are perceived. There is acknowledgement that, like any other learning tool, its misuse or abuse can certainly constitute academic misconduct, however the use of AI is not inappropriate *per se*. Despite this, the text addressing generative AI can sometimes be found in the academic integrity section of course outlines.

Overall GenAI is seen as an opportunity for engineering student learning, rather than as a threat. In particular, it is acknowledged that these tools are in use in engineering workplaces, and that it is therefore important that students become familiar with these tools during their studies.

Theme 2: Universities have set general policies, and academics are nominally free to implement those policies how they see fit

Across Australian engineering institutions, the governance of GenAI integration largely allows individual academics to tailor implementation of policies to their specific courses/units within broader university-level frameworks. This model of academic autonomy within institutional guardrails is evident at the University of Melbourne, the University of Canberra, and the University of the Sunshine Coast, where overarching GenAI guidelines and academic integrity policies are in place, but the final decision on GenAI use rests with the individual subject or unit convenor.

Similarly, at La Trobe University, academics can initiate GenAI-related changes that proceed through standard departmental approval. At the University of Wollongong, a broad university policy gives academics significant freedom in integration. The University of Technology Sydney (UTS) uses a layered framework that combines university-level policies for academic integrity with the autonomy for subject coordinators to design their specific learning and assessment activities. In contrast, a few institutions have adopted more structured or prescriptive approaches to ensure consistency.

The University of Queensland and Southern Cross University (SCU) provide academics with specific text or frameworks to select from, offering a clear and consistent yet flexible approach (Quince and Greenaway, 2025). The most centralised policies are at Monash University, which mandates a GenAI statement for every assessment, and the Polytechnic Institute Australia (PIA), where all decisions are made at the institutional level, and individual coordinators apply a unified policy without determining GenAI permissions independently.

While there was near universal agreement that individual academics are able to make course-specific decisions within the broader university frameworks, it is not clear that this is in fact the case operationally. One respondent did note that “many academics [are] understandably reluctant to make further amendments to course outlines specifically in response to generative AI”, suggesting that while they have the freedom to implement their own choices in their subjects, academics may not feel that they actually have the agency to do so.

Theme 3: Institutional training for academics on specific uses of GenAI is limited

Of the ten universities that were surveyed, most indicated that their institution was supplying standard wording for specific usage allowances of GenAI for an academic to communicate to students. This was either in the form of an overarching ideology for each subject, through the course guide for a unit or for a specific assessment piece. However, it was noted while the messaging from central for this communication was clearly specified, the usage of the policies was dependant on the attitudes and perceptions of the academic running the unit.

Interestingly, there was some variation in the tone in which these standard statements were described, with some respondents speaking of when AI is allowed, and others speaking of when AI is not allowed, suggesting a different underlying assumption as to what is the default setting for AI use at those institutions.

While the policies and procedures on how to ensure students are not misusing GenAI are easily attained, staff training on how to best use GenAI in their teaching is not so easy to find. Monash University was stated to be running in-person and online training of staff into how to use GenAI in their teaching practice and how they might be able to explicitly teach the use of GenAI. Southern Cross University and Polytechnic Institute Australia reported their institute provides support materials and asynchronous training opportunities for staff and students alike in the form of online modules. However, for the most part most universities suggested that it is up to the academic in charge of the subject matter on how GenAI is integrated into their curriculum, but no formal support mechanism to do so was identified in the responses.

Theme 4: Academics are thoughtfully using GenAI in different ways in their classes, but this is causing confusion for students

There is growing concern about student confusion resulting from inconsistent approaches to GenAI across courses. While some educators are actively exploring its pedagogical value, such as for formative feedback, assessment innovation, or AI literacy, others prohibit its use outright. This inconsistency has raised concerns regarding the possible conflicting expectations for students. Although most Australian universities in this study have GenAI-related policies or guidelines, implementation at the unit level varies widely. Messaging to students also differs: some are told to "use with integrity" or provide "appropriate acknowledgement," while others receive more restrictive or ambiguous guidance.

These inconsistencies have led to what several academics described as "significant confusion among students." Students find it "quite complex to navigate" the differing rules and expectations between units. Despite overarching institutional policies, a lack of coherence in implementation undermines students' ability to confidently and responsibly engage with GenAI. Worryingly, this confusion is believed to be contributing to a "rise in misconduct cases," as students inadvertently misuse GenAI tools or fail to correctly declare their use. Moreover, when assessments or course outlines fail to clearly articulate GenAI usage expectations, students are left guessing, which can lead to either unintentional misconduct or missed learning opportunities.

This fragmentation is caused in part because academics are adopting nuanced approaches to using GenAI in their teaching, which leads to variation in what use is acceptable. However well intentioned, this fragmentation in practice not only creates stress for students but also jeopardises consistency in learning outcomes.

Discussion

This study uncovers the tension between institutional policies and academic autonomy in the integration of generative AI into engineering curricula. While most universities have issued broad policies or templates, the responsibility for interpreting and applying these guidelines falls to individual educators. This autonomy allows for flexibility and pedagogical innovation but also exposes a lack of systemic alignment. Academics reported both the freedom to adapt AI messaging and a reluctance to act, whether due to perceived risks or unclear institutional expectations. The result is a fragmented implementation landscape where some instructors experiment with AI-enhanced assessments, while others defer to generic statements that may not reflect their actual teaching practice. This raises important questions about institutional support for innovation and the governance models that underpin curriculum decision-making.

One significant outcome of this fragmentation is student confusion. When each subject frames GenAI differently, some encouraging it as a tool, others warning against it as a risk, students are left to navigate inconsistent expectations. This issue is particularly problematic when different assessment items within the same subject adopt varying stances on AI use. Without clear, consistent, and contextualised communication, such as that offered by a framework like AIAS (Perkins et al., 2024), students struggle to understand when and how GenAI use is acceptable, ethical, or even encouraged. Such frameworks, however, are in and of themselves not enough to ensure usage remains within the given boundaries. Several respondents pointed to a rise in academic misconduct cases that may stem not from deliberate deception, but from misunderstanding due to this unclear or conflicting guidance. Even where policies exist, they often lack the nuance needed to address the complexity of AI use in diverse engineering contexts.

Further compounding this problem is the absence of program-level transparency. Both students and academic staff currently have limited visibility into how GenAI skills are scaffolded across an entire degree program. As GenAI adoption expands, it is essential that universities move beyond course-by-course implementation toward coherent programmatic integration. This includes mapping AI capabilities across subjects and assessment types to ensure developmental

progression, as well as making this progression visible to students. Without a transparent framework for how AI literacy builds over time, students cannot fully engage with these tools or reflect on their evolving responsibilities. A programmatic view would also enable better alignment with graduate attributes and industry expectations, particularly in engineering, where AI is rapidly reshaping professional practice. Notably, only one institution in this study reported that GenAI integration was occurring as part of a broader curriculum renewal process, highlighting how rare program-level planning currently is in the sector.

The analysis underscores a critical need for institutions to not only provide clear policy frameworks but also to ensure their consistent implementation. Alignment of messaging, staff training, and student guidance are essential for reducing ambiguity and promoting equitable, meaningful GenAI integration in engineering education. While some universities have begun offering standard wording or optional training modules, most academic staff are left to navigate this transformation without structured support. To address this, institutions must prioritise professional development and foster communities of practice where educators can share strategies, explore tools, and co-develop GenAI-integrated pedagogies. Without this investment, the burden of implementation will continue to fall unevenly on individual academics, and student experiences with GenAI will remain inconsistent and inequitable.

Limitations and Future Directions

This study's findings are based on a qualitative survey of 12 engineering academics from ten Australian institutions. While the purposive sample enabled in-depth exploration of GenAI policy implementation within engineering education, the small sample size and potential self-selection bias limit the generalisability of the results. Academics with a strong interest in GenAI may have been more inclined to participate, potentially skewing the perspectives captured. Future research should aim to expand on these findings through broader institutional studies and direct engagement with students. Surveying students would help quantify the extent of confusion reported by staff and provide a clearer picture of how GenAI policies are navigated.

Conclusion

The integration of GenAI in engineering education is evolving rapidly, with universities adopting broad policy frameworks to govern its use. However, academic autonomy remains central to how these policies are being implemented, resulting in significant variation in GenAI application across courses. While many institutions provide general guidance and ethical frameworks for GenAI use, the flexibility afforded to individual academics often leads to inconsistencies in expectations and messaging.

Despite the flexibility, the lack of structured support and training for faculty members hampers the effective and consistent use of GenAI tools in teaching and assessment. While some universities offer standard wording and guidelines, the absence of mandatory training means that the onus remains on subject coordinators to navigate this complex landscape. This has led to a situation where academics are innovatively applying GenAI in their courses, but students are left to contend with disparate expectations, creating confusion and uncertainty.

The variance in GenAI usage between assignments and across subjects is a source of student confusion, as conflicting guidelines and ambiguous policies make it difficult for students to navigate the appropriate and ethical use of these technologies. As the use of GenAI continues to expand in engineering curricula, there is a need for greater coherence in policy application, better support for staff, and a more transparent framework for students to follow. Universities should prioritise addressing these challenges to help ensure that the benefits of GenAI can be realised, while maintaining academic integrity and fostering responsible, ethical engagement with AI tools.

The findings underscore the need for a more unified approach that balances the innovative potential of GenAI with the rigorous academic standards required in engineering education. This

can be achieved through the development of clearer policies, standardised language, and enhanced faculty training, all of which will contribute to a more consistent, transparent, and equitable use of GenAI across university curriculum.

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