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Reflective engagement with visual AI tools in interior design education: A case study

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Abstract

The integration of artificial intelligence (AI) in design education presents both opportunities and challenges for developing future-ready graduates. This study investigates how final-year interior design students engaged with generative AI tools during a brief that required them to improve a previous submission by working on rendering quality, refining project presentation layouts, with the option of incorporating AI-assisted tools. Students explored platforms such as Midjourney, Photoshop, and Revit, concluding with a written reflection on their process. (Yanhua 2024) posits that "AI can transform interior design, addressing existing gaps and fostering a deeper understanding of the symbiotic relationship between advanced technologies and creative processes". While their use of tools demonstrated visual advancement and iteration, the reflections revealed a gap in reflective practice. This gap is significant given AI's increasing role in creative disciplines and the need to cultivate reflective practitioners. Methodologically, the paper employs a qualitative approach which draws on Schön's (1983 1987) concepts of reflection-in-action and reflection-on-action, the study applied a qualitative coding method to analyse student reflections using six criteria that looks at action description, rationale, outcome evaluation, insights gained, future improvements, and critical depth. Findings suggest that the students treat reflection as a task to complete rather than a means for iterative learning. This aligns with Laher's (2025) caution against the uncritical use of AI-generated content, which can undermine student agency and ethical responsibility. The study argues for clearer reflective scaffolding that emphasises authorship, critical engagement, and long-term learning. Recommendations include embedding structured prompts and recommendations for what the prompts should be. These strategies support curriculum development that encourages students to think critically about their tools, decisions, and design identity. In doing so, the study contributes to the evolving pedagogy of AI-integrated design education. This paper contributes to the discourse on digital disruptions in design education by proposing strategies for leveraging reflective thinking when engaging with AI. As AI continues to reshape creative industries, this research underscores the importance of equipping design students with adaptive skills that merge technological proficiency with critical engagement.

Keywords: AI in design education, reflective practice, interior design education, design thinking, curriculum development, digital disruptions

Introduction

The rise of AI in higher education has prompted numerous conferences, workshops, and policy developments, including specific plagiarism policies addressing AI use by faculty and students. While

this cautious approach is understandable, it often translates into classroom practices that undermine the imperative for digital transformation in design pedagogy. As industries shift with technological advancement, curricula must consider how to prepare students not only to engage with industry practices but also to challenge and innovate within them.

So how can Interior design education be positively responsive to teaching students the use of AI within their design process. This is both exciting and challenging with visual AI models able to generate visuals that express design intent. Although flawed, generative visual AI models allow rapid prototyping at a pace previously unattainable for Interior design students.

This research is situated within a multicampus, private higher education institution (PHEI) which offers design qualifications in South Africa. The institution currently centralises the academic curriculum design for content and assessments with a mixture of full time and part-time lecturers teaching this curriculum. Lecturers are currently not involved in the development of academic content. Academic content and assessments are accessed by both students and lecturers through a Learning Management System (LMS), which also serves as the platform for submitting assessments.

Research objectives

Our study aims to explore the following key questions which we hope contribute to design education pedagogy and curriculum development.

- To investigate how third-year interior design students engage with generative visual AI tools in applied design projects.
- To evaluate the depth and quality of students' reflection-on-action when documenting AI use in their design process
- To contribute to curriculum development by proposing guidelines and assessment considerations for critical engagement with AI in design education

By focusing on a third-year cohort, the research examines both the application of AI in students' design workflows and the reflective practices that accompany this engagement. Drawing on Schön's framework of reflection-on-action, the study qualitatively analyses students' submitted reflections to evaluate the depth and criticality of their learning.

Reflective practice theoretical framework

This study is grounded in the seminal work of Donald Schön's Reflective Practice. In it Schön speaks to a designer making a final artifact that once realised may generate effects beyond the original intent, with the designer then taking account of this by "forming new appreciations and understandings and by making new moves he shapes the situation […] the situation "talks back", and he responds to the situation's back-talk". (Schön 1983, p. 79). And so Schön argues that in a good design process the "conversation with the situation is reflective" (Schön 1983, p. 79). Schöns theory of Reflective Practice offers a lens for understanding how students engage in cycles of reflection-in-action (Schön 1990, pp. 28–29) which takes place in the moment and influences ongoing activity and reflection-on-action (Schön 1990, p. 26) which involves examining past actions after they have occurred, to make sense of outcomes and inform future practice. The brief being discussed fits as they revisit and rework previous projects. In addition to this, the requirement to document and reflect on AI use aligns with this framework as students have been asked to document AI tools and techniques used.

Within the institution, reflection is built into theoretical subjects more explicitly while in applied design subjects such as the one that contains the brief, this is more implicit, and so students may miss this opportunity to pause and reflect. This skill for reflective practice becomes a key component in design education and development towards professional knowledge. As students engage with AI tools and the unpredictable outputs they are required to interpret, critique, and respond to these in ways that mirror the challenges faced by professionals in practice, a reflective conversation with the tools and situations that "talk back" during the design process (Schön 1983). Through cycles of reflection-in-action and reflection-on-action, students begin to develop what Schön calls professional knowledge: an embodied capacity for making informed, context-sensitive decisions in the face of uncertainty.

Genai and higher education

The integration of Generative AI (GenAI) tools in higher education presents a moment of both disruption and possibility. Jin *et al.* (2024) trace this evolution from early symbolic systems to today's expansive use of generative technologies like Large Language Models (LLMs) and AI-Generated Content (AIGC) highlighting the increasingly embedded role of AI in creative fields. These tools are no longer supplementary; they are becoming co-constructors of student work output and knowledge development.

Chaudhry and Kazim (2022, p. 158) outline four main subdomains of AI in Education which are "reducing teachers' workload, contextualised learning for students, revolutionising assessments and intelligent tutoring systems (ITS)". We believe that this study seeks to look at the revolutionising assessments subdomain of AI which seeks to give us a better understanding of students and "what they know […] how they learn and which pedagogies work for them" states (Chaudhry & Kazim 2022). In Laher's (2025) editorial for the South African Journal of Psychology, a distinction is made between AI-assisted vs. AI-generated content of which the former is "written by an individual but has been improved with the aid of AI tools"(Laher 2025, p. 155) while the latter is "produced by the AI itself [...] with little to no input from the individual author"(Laher 2025, p. 156). This distinction is important because it underlines the importance of human agency, authorship, and accountability as students navigate the responsible use of AI in their work.

We note that the integration of AI in the design process (the focus of these projects) presents a new arena where reflection-for-action is vital. Professionals are still figuring out best practices for using AI in design; thus, having students contemplate how they might better harness or constrain these tools next time is crucial. Delport (2023) in a study on AI and design education, found that students, when guided, could suggest future strategies for blending AI and traditional methods. Encouraging our students to similarly think ahead could prepare them to adapt in the evolving landscape of AI-assisted design.

Methodology

This study makes use of a qualitative case study design in a private higher education context, specifically within an Interior Design programme. It focused on a third-year subject brief where students revisited a second-year submission and reworked it through improved rendering, redesigned layouts with the integration of AI tools (e.g., Midjourney, Photoshop, Revit). Data comprised of final submissions for the brief, including visual outputs, AI usage documentation, and presentation layouts. The study analysed a total of 22 student submissions. These materials were collected from the institution's Learning Management System (LMS) as part of students' formally assessed work. This

data was analysed thematically to explore how students used AI for conceptual development, technical refinement, rendering and design development, and how they reflected on their use of AI.

Students were given key focus areas in the brief as a guide which were enhancing the rendering quality of their original second-year interior design projects, using advanced rendering techniques to improve realism, lighting, and material representation in line with current industry standards. Second, they were tasked with redesigning project page layouts to improve clarity, flow, and visual storytelling. Third, the brief introduced integration of AI into the design workflow asking students to explore how AI could enhance the design process. For this, students explored the use of tools such as Midjourney, Photoshop, Revit, and ArchiCAD to generate ideas, support material selection, or enhance visual outputs. The brief specifically required students to reflect on their use of AI, evaluating whether it meaningfully contributed to the development and refinement of their design.

The deliverables for the submission were aligned with the key focus areas as depicted in the table:

Table 11: Alignment of key focus areas and submission deliverables

Key Area of Focus	Corresponding Deliverable/s
Rendering Quality	Provide high-quality rendered images that showcase the design from various angles and perspectives. Include before-and-after comparisons to highlight the improvements made.
Project Page Layout Improvements	Submit a redesigned project presentation with improved page layout and graphic elements. Include annotations, descriptions, and any additional information necessary for a comprehensive understanding of the design.
Incorporation of AI	Present a brief documentation detailing the AI tools or techniques used in the project.

Although the key focus areas and the deliverables are aligned, the alignment of the key focus areas and the outcomes of the brief are not strongly aligned. The institution makes use of a criteria-based assessment which means that the submission produced by students is assessed against set assessment criteria to assess the level of their applied competence. The assessment criteria as previously discussed are centrally set by the programme development team.

Below are the outcomes and the assessment criteria of the brief.

Table 12: Outcomes and assessment criteria of the brief

OUTCOMES	Upon completion of this brief, the student should be able to: • Demonstrate integrated knowledge of critiquing and improving on their own design. • Present and communicate complex information reliably and coherently using appropriate documentation.
ASSESSMENT CRITERIA	Achievement of the outcomes is evident when the student: **Creativity** • Creatively communicates improvements made through the use of appropriate documentation. **Knowledge** • Demonstrate integrated knowledge of critiquing and improving on their own design through the use of appropriate techniques. **Skill** • Be able to creatively and coherently present and communicate the construction of their own design in a suitable language through the use of appropriate documentation. **Value** • Confidently and accurately identifies, evaluates and addresses their own task specific learning needs specific to outcomes. • Confidently takes full responsibility for their own work and decisions through successful time management and resource use of the process document.

While the brief's key focus areas and deliverables clearly require students to engage with artificial intelligence (AI), specifically through the integration of tools such as Midjourney, Revit, and Photoshop, the learning outcomes and assessment criteria do not reflect this emphasis. This creates a misalignment between what students are asked to produce and how their work is formally evaluated. The assessment criteria are generic and do not provide specific criterion to evaluate how effectively students engage with AI to support design process or the reflection of this. As a result, students are not formally assessed and credited for navigating or reflecting on the use of AI tools, despite being tasked with doing so. Without explicit references to AI in the outcomes and criteria, students may be not well supported in developing reflective, future-facing design skills. Revising the outcomes and assessment framework to align with the AI-related expectations of the brief would ensure more coherent and relevant assessment.

To ensure alignment, both the outcomes and criteria should be expanded to include explicit reference to AI integration, critical reflection, and the intentional use of digital tools in the design process.

The study will include student submissions that meet the following criteria:

- The work must have been submitted in fulfilment of the identified brief.
- Only completed and marked projects that form part of the official academic record will be included in the analysis.

The study, which investigates one campus, will act as a pilot study for broader investigations across multiple campuses. A qualitative content analysis approach was used to examine the student reflections as part of the AI engagement documentation. Each reflection was reviewed using an evaluation framework informed by Donald Schön's theory of reflective practice with specific reference to the concept of reflection-on-action. This framework evaluated the depth and quality of reflection and how students interpret their use of AI tools. Each student entry was read and scored for presence or absence of these features. Qualitative excerpts were then thematically analysed to identify recurring patterns, gaps in reflection, and the depth of engagement with AI tools. This allowed for both quantitative mapping of reflection quality across the 22 entries and thematic interpretation of students' engagement with visual AI models in their design process. To protect student confidentiality, all entries were anonymised and labelled using identifiers (e.g., S1, S2).

Evaluation of depth and quality of reflection by students

In this section, the analysis focuses on analysing the reflections submitted by students as part of the brief in seeing how students described the process and learning after engaging with AI on the reworked design submission. Reflection-on-action includes examining the decisions that were made, evaluating their effectiveness, and considering how to improve or do things differently next time. For this section the following criteria were used to evaluate:

- Was there a clear description of their actions? Did the students describe what they did in the project?
- Was there reasoning and rationale? Here we looked for indications of why they took those actions. Are they explaining their reasoning or the rationale behind their decisions?
- Does the student evaluate the outcome of their actions? Do they mention what went well or what problems arose?
- What learnings or insights were gained by the students? Does the reflection include insights, new skills, or knowledge that the student gained?
- Was there any mention of future improvements because of what was learned?
- Is there depth to the reflection? Are students simply narrating what they did, or are they questioning and analyzing their experiences?

When looking at the criteria and the collected data, the following emerges. Amongst the 22 submissions evaluated for the class group.

Table 13: Frequency of student engagement with reflection-on-action criteria

Reflection criterion	**Students addressing (n = 22)**
Clear description of actions	11 (50%)
Reasoning and rationale	1 (5%)
Outcome evaluation	4 (18%)
Learning and insights gained	2 (9%)
Future improvement or next steps	1 (5%)
Depth of reflection (critical analysis)	1 (5%)

Table 3 summarises how many of the 22 students' reflections addressed each of the six criteria of reflection-on-action. All student entries were included in this analysis, even those whose reflection

content was not submitted. Each criterion was coded as present (1) or absent (0) for each student based on the qualitative assessment above.

As the matrix shows, descriptive writing of their actions was achieved by half the class. This was also due to a number of students (seven) not submitting a reflection at all. Students meeting the more advanced criteria were strikingly scarce. Only one student demonstrated reasoning, only one outlined future steps, and only one reached a critically reflective depth. This distribution highlights a trend also noted by Lousberg *et al.* (2020): many design students' reflections cluster at the lower levels of reflection, with very few achieving the higher levels. The challenge for educators is moving that cohort distribution upward.

Below, we will go into further detail about the findings under the various criteria headings.

Clear description of actions

Definition: A reflection meets this criterion if the student clearly describes what actions they took during the project. This is the foundational level of reflection and what happened with the students reflective writing. It corresponds to what Moon (2004) calls descriptive writing, the first step toward deeper reflection. Of the 22 students only 11 provided a clear description of their design actions These students detailed the tools, techniques, or steps that they employed, often in chronological order. For example, one student outlined a sequence of AI-assisted rendering tasks:

> I incorporated AI in my design using the following: I used AI to help me remove my rendered exterior background to form a PNG using Photoshop (Beta). Then I used [an] AI PicArt to create a background using descriptive words like 'sandy, scrub and dry bushes in a coastal setting' to describe what I want. I then placed the PNG over the AI-generated background for crispness and, in Photoshop, added mountains and an ocean (S4).

Describing actions addresses the "what was done" component of reflective learning. It aligns with Schön's notion of making tacit knowledge explicit which practitioners often know more than they can say, and reflection begins by bringing that implicit action-knowledge to the surface. The concern is that staying at this descriptive level is not sufficient for deep learning. Moon (2004) would classify most of these accounts as descriptive reflection.

Reasoning and rationale

This criterion assesses whether the students explained the reasons behind their actions. Good reflections not only recount what was done, but also why it was done that way. Only 1 out of 22 students clearly articulated reasoning or justification for their actions. Most students described what they did without examining their motives or decision-making. The only exception was student S3, who included a dedicated section "Reasoning behind AI used" and provided explanations for tool choices:

> I used Twinmotion for my renders because I had not yet mastered Revit cloud rendering and that is still a work in progress (S3).

The lack of rationale suggests that students either did not recognise the importance of explaining their reasoning or lacked the reflective skill to do so. It's possible the assignment prompt did not explicitly ask enough "why" questions, resulting in students focusing on tools and outcomes over reasoning. Future revisions of the brief could include guiding questions.

Outcome evaluation

This criterion examines whether the students evaluated the results or outcomes of their actions. In other words, did they reflect on the successes, failures, or effectiveness of their design and process?

This involves comparing intentions to outcomes and identifying what worked well or poorly and assessing the project against criteria or goals. Only 4 out of 22 students (18%) engaged in any substantive evaluation of their design outcome. A few students acknowledged changes made and improvements achieved, suggesting that they did step back to check the effectiveness of their work. For instance, one student described how they revisited and improved a major aspect of the design:

> Changes I've made: I changed the kitchen layout. In the original design the kitchen was against the wall and had no seating. In the reworked design the kitchen is smaller, more ideal for a weekend getaway, and there is now seating available for eating at a table. The finishes have been changed to give the house a more dynamic feel rather than all the walls being the same colour (S13).

The student (S13) not only lists what they modified but evaluates them, namely the new kitchen layout is explicitly deemed "more ideal" for the project's context, indicating a considered improvement. This student goes on to explain additions (ceiling and specific lighting choices) and the rationale in terms of design intent (maximising natural light). Apart from these instances, most students did not explicitly state how well their design or use of AI worked. There was minimal critique of the end result or discussion of whether the project met its objectives.

Learning and insights gained

This criterion is met when a reflection identifies what the student learned or the insights they gained from the experience. This calls for students to go beyond description or outcome critique; it requires the student to abstract from the experience and articulate new knowledge, skills, or self-awareness, answering in reflection "What did I learn from this project?"

Only 2 out of 22 students (9%) explicitly stated any learning or insight gained. It appears that most students did not move from narrating the experience to generalising lessons from it. The few who did, focused on very concrete and technical skills learned. For example, one student enumerated and mentioned new skills:

> What I learned: I learned how to do artificial lighting in Revit and how to create an internal 3D view. I also learned how to properly render using the Revit Cloud. I learned how to model in-place and how to change materials of objects (S8).

Another reflected on her growing proficiency and confidence with a key software tool:

> I learned how to render in Revit and figured out how to put the lights on (although I think some of them are still upside-down). I am learning with each brief, a few tools and techniques that bring me closer to creating the beautiful renders I envision in my head! […] I'm still proud of myself for learning how to [use] Revit, and it is getting easier and easier (S6).

These quotes show that when students did identify learning, it was predominantly technical (software, rendering techniques). S6's comment also reveals an affective insight, pride in her progress, which is a valuable reflective recognition of personal growth. The lack of "learning statements" is concerning because the purpose of reflection-on-action is precisely to articulate and consolidate learning from experience. It is possible some students did gain insights but failed to document them, perhaps assuming it was obvious or not knowing how to express it. This points to a need for teaching how to derive and state lessons learned. Only S6 and S8 clearly "closed the loop" of the experiential learning cycle by stating new knowledge gained.

In Kolb's Experiential Learning Model, concrete experience followed by reflective observation should lead to abstract conceptualisation (generalising lessons) and then active experimentation in future

tasks (Kolb 1984). These two students showcase reaching an "abstract conceptualisation" stage in their writing. Lousberg *et al.* (2019) measured student reflections and found only slight increases in level over time, concluding "there is significant room for improvement" in students' reflective capacity and that a higher level is "both possible and desirable" (Lousberg *et al.* 2020, p. 893). Our findings concur that students need to be guided to identify insights, not just describe events.

Future improvement

This criterion looks at whether the students discussed how they would apply their experience to future situations or what they would do differently next time, essentially reflection-for-action. This criterion was met by only one student (S4) who, after describing her AI-based rendering workflow, shared how it would benefit her efficiency in the future:

> In the future, it will save me a lot of time to generate a background [with AI] rather than creating a time-consuming landscape [manually] to create a realistic environment for my clients (S4).

The lack of reflection-for-action in 95% of the submissions suggests that students may not naturally extend their reflections to future planning unless prompted. It is possible that students felt it beyond scope or that the brief needed to explicitly state this in the reflection section. It might also indicate they are still in a mindset of completing an assignment rather than iteratively improving their craft, i.e. "I finished this project, reflection done" rather than "Here's what I'll carry forward". Encouraging a more longitudinal view of learning could help shift this mindset.

Depth of reflection

This criterion gauges the overall depth and criticality of the reflection. A "deep" reflection is one that goes beyond description into analysis, questioning, and synthesis. It may involve critical self-examination, consideration of alternative approaches, or insight into one's own biases and knowledge gaps. In Moon's (2004) taxonomy, this corresponds to dialogic or critical reflection (as opposed to simple or descriptive reflection). Again, only 1 out of 22 students demonstrated a level of reflection that could be considered to be critical in nature or in-depth. Most reflections remained at a descriptive or minimally analytical level. The one notable deeper reflection was by S3. The reflection, in addition to providing rationale, captured a moment of critical self-assessment and adaptation:

> My front page really made me struggle in the beginning, I knew something didn't feel right but I didn't know what it was. I did finally restart my front page, which allowed me to learn easier ways to figure out even more on Photoshop and how to simplify elements (S3).

In this quote, S3 is not just recounting steps; she is critically evaluating her work ("something didn't feel right"), acknowledging that she was unsure, and then describing how she tackled it by reconsidering and reworking that aspect of the design. This indicates reflexivity whereby she monitored her own reaction to the work (aesthetic dissatisfaction), questioned it, and took corrective action, learning in the process. This kind of double-loop learning (questioning one's initial approach and assumptions) is a key to critical reflection (Argyris 1977).

Discussion and implications for teaching reflective practice

This analysis shows that while students can recount their design process to some extent, they struggle with deeper reflection-on-action aspects such as explaining rationale, evaluating outcomes, identifying lessons learned and how these impact their future processes. In light of Schön's work and

subsequent literature, there are a few key implications for reflection pedagogy in design education that we think will be beneficial for the students going forward:

Integrate reflection during design (reflection-in-action)

One point is that the brief itself may not have sufficiently integrated in-process reflection. Schön praised the architectural studio as an exemplary environment for learning reflection-in-action. If students cultivate reflection-in-action, questioning and adjusting their decisions in real time, they likely develop richer material to reflect on afterwards. Our findings suggest the need to bridge the gap between doing and reflecting. Educators might adopt practices from Schön's "reflective practicum" model, for example, providing opportunity for design critiques that explicitly ask students to verbalise their thought process during design, not just present the final results. This can train students in the habit of reasoning and self-critique, which can then be captured in reflection-on-action writing.

Explicitly teach and scaffold reflection skills

Students may simply not know how to reflect at a deeper level. Reflection is a learned skill that improves with guidance and practice. Dedicated time should be provided to explain what good reflective writing looks like, using appropriate frameworks and examples so as to make the implicit, explicit. Providing question prompts for each reflective criterion can scaffold students through the full reflective cycle. For instance, with the criterion in this article one could prompt in the following way:

> Describe what you did (Criterion 1),
>
> Explain why you did it that way (Criterion 2),
>
> How did it turn out compared to what you hoped? (Criterion 3),
>
> What did you learn from this? About tools, yourself, collaboration, etc.? (Criterion 4),
>
> What would you do in future as a result? (Criterion 5).

And then lastly,

> Step back and critically assess the process: what underlying assumptions were at play? What broader implications does your experience have for your work going forward? (Criterion 6).

Such prompts for reflection, if used regularly, can train students to automatically address the key aspects of reflection. Over time, this can help more of them progress from mere description to analysis and critique, climbing Moon's levels of reflection.

Embed reflection in the design curriculum, not as an afterthought

Reflection should not be seen as an optional brief deliverable or a once-off task, but rather as an integral part of the design process. Lousberg *et al.* (2020) stress that a reflection skills programme "will only be successful when it is closely related to, or even better, fully integrated into the design projects". This means making reflection a continuous activity in design journals, interim reflection checkpoints, and reflective discussions throughout the project, not just a final document submitted at the end. If students become accustomed to reflecting as they design (taking notes on decisions, feelings, surprises, etc.), their final reflection-on-action write-ups will be much richer. The data revealed that while a number of students could describe their design actions, few moved beyond surface-level observations to critically engage with the tools they used. In this case the tool was AI. This finding underscores Schön's assertion that professional knowledge develops through reflective conversations with uncertain, evolving situations (Schön 1983). In the context of AI-assisted design, the technology itself becomes part of the "situation" that talks back. Yet, without structured

opportunities to reflect-on-action, students may fail to notice how AI is shaping, not just supporting, their design thinking.

The educator's role is key in that they should model reflection (think-aloud about their own work), and value it in assessment so that students take it seriously. Our analysis showed some students wrote no reflection even though this was part of the deliverables. This missed deliverable did not impact the mark awarded further confirming to the students that this deliverable may not have been important. Embedding reflection more deeply, explicitly and assessing it with clear criteria can better indicate its importance. This also calls on the institution to incorporate reflection guidelines and tasks that prompt students at various stages of the design process.

Conclusion

In conclusion, the analysis of student reflections in engaging with AI makes clear that simply asking students to "reflect" is not enough; many will default to surface-level descriptions if not guided. The findings highlight the need for structured reflection prompts, explicit teaching of reflective skills, and a supportive curriculum that values and integrates reflection throughout the design process. As Schön (1987) advocated, educating the reflective practitioner involves "bridging the worlds of university and practice" in our case, bridging design doing with thoughtful reflecting. As AI continues to disrupt and enhance design education, reflective practice must become a core pedagogical strategy. Students must be supported in developing not just technical proficiency with AI tools, but also the capacity to critically evaluate how these tools influence their decisions, aesthetics, and problem-framing. Without reflection, the risk of over-reliance on generative outputs grows, potentially diminishing authorship.

By implementing the above strategies, we aim to help future students not only recount what they did but critically examine their design thinking and learn more deeply from each project. This will better prepare them for the complexities of professional practice, where they must constantly learn and adapt.

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