RESEARCH ARTICLE

Are You Sure? Exploring the Challenges and Opportunities of Using Generative AI in Communication Design Projects: A Cross-Cultural Case Study of Student Reflections, Bias, and Critical Engagement

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Abstract: Regardless of whether we approach Generative AI (GenAI) with apprehension or enthusiasm, the fact remains that AI has already made its way into many aspects of personal and professional life—including the field of communication design and, by extension, the education of future designers. While there is currently no consensus on how to incorporate GenAI into design education, the technical development within AI is happening faster than most of us can keep up with, and the ways in which we can utilise AI are becoming more varied by the day. Considering that the integration of AI in design will only increase in the coming years, it is essential to build strategies for preparing our students for their future careers. This paper presents a joint project conducted in autumn 2025 by two universities in Sweden and Australia that tasked students with creating posters representing an unfamiliar city using only AI-generated imagery. Through reflective writing, discussions, and analysis of their visual outcomes, the study examines how students negotiated both the opportunities and obstacles posed by GenAI. The project is framed against current literature on GenAI in design and education and seeks to contribute to the ongoing discourse on how design education can adapt to emerging technologies while maintaining critical and creative integrity. Findings show that while students valued GenAI's capacity for rapid ideation, they also encountered issues such as factual inaccuracy, stylistic inconsistency, and cultural bias. These challenges underscored the importance of maintaining strong foundational design skills, as well as developing students' critical awareness of the ethical, cultural, and semiotic implications of AI-generated imagery. The study contributes insights into how communication design education might meaningfully integrate GenAI while sustaining critical and creative integrity.

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1. Introduction

The rapid emergence of generative AI (GenAI) has the potential to unsettle familiar methods and routines within design practice and design education. For many, designers and educators alike, GenAI represents a technological shift that brings with it a great deal of ambiguity; a tool that shows promise to expand creative options while also disrupting conventional assumptions about authorship, skill, and visual literacy. Communication design is very much at the centre of this transition, being a field occupied with the relationships between form, meaning, culture and representation. Yet, considering the immense attention paid to AI in media, news and society today, empirical research on how design students experience and make sense of such tools remains relatively scarce.

The aim of this study is to address that gap by exploring how third-year communication design students in Sweden and Australia engaged with GenAI during a cross-cultural, project-based assignment. Rather than evaluating AI's technical capabilities, the project sought to understand the interpretive, experiential, and meaning-making dimensions of students' encounters with GenAI: how they used it, where they struggled, what they valued, and how they articulated the relationship between AI processes and their own design judgement.

The research question guiding this project was: *How do communication design students regard the use of generative AI in a cross-cultural design assignment?* This was inspired by discussions I have had with colleagues and design students on the integration of GenAI in design practices. The study examines not only students' creative and technical challenges, but also the cultural, semiotic, and ethical tensions revealed in their attempts to represent places unfamiliar to them. In doing so, the project does not position GenAI as either positive or negative, but as a culturally situated production tool that mediates between intention and outcome, often in ways students do not expect.

Design education has always evolved in response to new technologies, from desktop publishing to motion graphics to web design. But GenAI alters the relationship between designer, tool, and output in ways that demand renewed critical attention. As students discovered, the promise of instant visual generation also brings aesthetic instability, factual drift, stereotypical outputs, and a heightened need for interpretive skill. These tensions reveal important insights for educators seeking to support students' development in an increasingly AI-augmented landscape.

By analysing student reflections, discussions, and visual artefacts, this study contributes to ongoing conversations about how design education can integrate GenAI while preserving the critical, semiotic, and ethical foundations of the discipline. The findings have particular relevance for educators navigating questions of creative agency, prompting literacy, data-driven representation, and the enduring importance of foundational design skills in a rapidly shifting technological environment.

2. Background

The literature search for the study was primarily done using Google Scholar, Scopus, Web of Science, and ScienceDirect, supplemented by reference tracing in relevant articles. Search strings included "(visual/graphic or communication) design and AI + GenAI" "education and AI + GenAI," and "(visual/graphic or communication) design education and AI + GenAI." This search process provided a cross-disciplinary view of current literature on GenAI in creative and educational contexts. While the field is expanding rapidly, the literature remains fragmented, particularly in relation to design-specific pedagogies. The following subsections present an overview of some relevant strands of this still-forming body of research.

In a comprehensive literature review, Yusuf et al. (2024) provided an overview of recent articles that focused on GenAI and education. The authors showed that interest in these topics is very much on the rise, but an analysis of the educational disciplines included in the review concluded that design was not among those disciplines that had been the topic of more than one article (out of 407 publications), signalling a significant absence of design-focused research in a field undergoing rapid technological change.

Design researchers are starting to react however, demonstrated by a more current overview of the research agenda in creative contexts by Heigl (2025). But her text calls for bigger efforts, as Heigl identified several research gaps that need attention within design and artistic research, such as the long-term effects of GenAI, its socio-economic implications on creative industries, the building of ethical frameworks and studies on people's perception of AI-generated material. Against this backdrop, the following sections outline the key themes currently shaping discussions on GenAI within design practice and design education.

2.1. The Rise of GenAI

While the term "AI" has become nearly ubiquitous, being used for various sorts of machine learning, this paper will primarily focus on GenAI, which entails a range of artificial intelligence models designed to produce material (images, videos, text or audio), using models that mimic aspects of human cognition (Dwivedi et al. 2023;

Yusuf et al. 2023). Through machine learning and using enormous databases, these systems identify patterns and structures in existing material, which in turn become the raw material the systems use to generate new material, using probabilistic models (Mandapuram et al., 2018).

Currently we find ourselves at what will undoubtedly be considered a turning point in the widespread adoption of GenAI, with rapid uptake across professional and personal contexts. The pace and scale of this shift have prompted comparisons to earlier technological revolutions; for example, Geoffrey Hinton has likened the significance of AI to the invention of the printing press or even the wheel (CBS Mornings, 2023). Yet, unlike previous technological shifts, such as the arrival of desktop publishing (DTP) in the early 1990s—which I personally experienced as it affected my own field of graphic design—today's AI tools span an immense range of applications, from text-to-image generators like Firefly and DALL·E to more complex systems like Stable Diffusion. This breadth opens GenAI to both novices and experts alike in practically all parts of society.

The rapid development of AI has been described by some as one of the most disruptive technological changes society has encountered (Păvăloaia & Necula, 2023), presenting significant challenges for education. It also amplifies concerns around technological opacity. Drawing on Latour's (1999) notion of "black-boxed" technologies—tools so familiar that their inner workings become invisible—the internal logic of GenAI remains obscured, even as it shapes creative processes. This reality underscores the importance of developing conscious, iterative approaches to working with GenAI in design practice.

2.2. Creativity and GenAI in Design Practice

The question of whether AI can be considered "creative" has no definitive answer, in part because creativity itself is difficult to define. Many descriptions highlight divergent thinking, reflection, and the ability to depart from linear or habitual approaches (Abraham & Windmann, 2007; Cropley et al., 2022; Runco & Jaeger, 2012). Mumford et al. (2012) emphasise the importance of metacognition—the ability to assess, select, and develop ideas. By these criteria, AI alone is unlikely to qualify as creative.

However, GenAI can play a productive role within human–machine collaboration. These tools can rapidly generate numerous variations, providing designers with material that can spark ideas, refine directions, or serve as visual inspiration. Seidel et al. (2018) suggest that this may lead to a shift in creative practice, which they refer to as a "triple-loop approach" (p. 51). The authors describe such an approach as involving three elements: the generation of alternatives based on input parameters, a feedback loop where the designer evaluates and modifies the outcomes, and a third step consisting

of mutual learning, where the designer gains insight into the machine's mental models and the machine learns more about the designers' thought processes.

The topic of creative decision-making by AI systems has raised concern and caused apprehension by some, seeing a risk of potentially undermining a fundamental human trait with unforeseen repercussions. Yet scholars like Sims (2024) propose a more nuanced view, comparing GenAI use to the discipline of photography. Mastery in photography requires extensive experimentation, the cultivation of an aesthetic sensibility through trial and error, and the ability to discern what should be kept or discarded. Similarly, skilful use of GenAI demands the development of prompting strategies, visual judgement, and conceptual clarity—abilities that remain squarely within the domain of human creativity.

2.3. Integrating GenAI into Design Education

The integration of GenAI into education has provoked diverse reactions. Some celebrate its potential, while others express mechanophobia—a fear that AI may diminish human creative value (Fleischmann, 2024). While some might argue that the easy access to GenAI will eliminate the need for educated designers, the fact remains that most people are not autodidacts and prefer guidance, which places educators in a crucial role. Saéz-Velasco et al. (2024) found that while professional designers see value in AI, students must retain competence in composition, colour, and form to avoid producing homogeneous or biased outputs, a concern also raised by Bianchi et al. (2023). The importance of maintaining human creativity is similarly argued by Marble (2025), stating that GenAI should be introduced only after students have cultivated independent design skills.

On the pedagogical front, Putjorn and Putjorn (2023) found no evidence that GenAI promotes creativity or collaboration on its own, though it can support ideation when paired with advanced prompting skills. This has led artists and scholars—such as Boris Eldagsen, who coined the term "promptography" (Bainbridge, 2023)—to frame prompting itself as a creative act. Ethical and contextual awareness is also critical: Hwang and Wu (2024) caution that students must understand the risks of cultural misrepresentation and stereotyping. Gray (2024) adds that as AI continues to reshape creative labour, educators must prepare students not only technically but also ethically, legally, and professionally.

2.4. Pedagogical Opportunities and Challenges

Outside the field of design, AI has demonstrated potential for personalised learning and instructional support (Hwang & Wu, 2024; Islam et al., 2023), increasing self-efficacy by offering inspiration and instructional support. In fields such as music education, AI

can facilitate contextual and interactive learning, though excessive reliance may reduce students' motivation to develop fundamental creative skills, such as creating melodies and harmonies (Merchán Sánchez-Jara et al., 2024). García-López and Trujillo-Liñán (2025) have pointed out three primary benefits of AI: personalisation, equitable access, and the development of critical competencies. The authors stress the need to address ethical questions, regulations, and definitions of educational quality. Albar Mansoa (2024) highlights similar benefits and concerns, noting that fine art students express worry about ethical implications and threats to artistic integrity.

Within design education, the sheer generative power of AI introduces new challenges. Omran Zailuddin et al. (2024) note that GenAI can overwhelm students with excessive visual material, potentially stifling creativity rather than enhancing it. This positions educators as guides who must help students navigate abundance with intentionality and critical awareness.

Matthews et al. (2023) remind us that design education has always adapted to new technologies—from the emergence of DTP to the rise of web and new media. At the same time, Dziobczenski and Person (2017) highlight how the contemporary designer's role increasingly includes facilitation, project management, and interpersonal communication. These expanded expectations intersect directly with AI-enabled workflows, making social, reflective, and entrepreneurial skills more important than ever.

2.5. Sustainability and Technological Vulnerability

Sustainability is seldom addressed in the literature on GenAI in education. Large-scale AI systems rely on massive data-centre infrastructure, with uncertain long-term economic and environmental viability (Costa et al., 2024; Ivanov & Lyu, 2024). These concerns extend into pedagogical settings, where students depend on systems that may be fragile or inaccessible.

Today, many of the widely used GenAI systems rely on a cloud-based infrastructure, which can introduce dependencies on external services, licensing models, or institutional access. However, it is important to point out that some generative models can also be used locally, depending on hardware capacity and technical expertise. These variations are demonstrative of the rapidly evolving and heterogeneous nature of modern GenAI, and raise broader questions about future access, reliability, and long-term sustainability in educational settings.

2.6. The Human Role in AI-Augmented Design

Pratschke's (2024) concept of generativism frames the relationship between designer and GenAI as a cooperative process, where algorithmic capabilities complement human criticality, contextual understanding, and reflective judgement. While GenAI

can support analysis and generation, it cannot replace the nuanced creativity required for meaningful design. Pratschke's work reinforces the importance of helping students develop an informed, reflective, and creative approach to GenAI—not a passive or purely receptive one.

Multiple studies reiterate that effective use of GenAI depends on a foundation of strong design skills (Ray, 2023; Xu et al., 2019). Without aesthetic literacy and conceptual grounding, users risk creating repetitive, biased, or visually misleading outcomes. In an educational setting, this underscores the need to cultivate reflective engagement, ensuring that students remain active authors rather than passive recipients.

2.7. Conclusion: Adapting Design Education for an AI-Driven Future

Across the literature, there is broad agreement that the inclusion of GenAI is inevitable and that curricula and teaching methods must be adapted for a new reality in design. There is a consensus on the ability of GenAI to function as a partner in a creative process, facilitating quicker and more varied conceptual approaches, prototyping and sketching. To successfully use GenAI in a way that will lead to innovative solutions, authors also see a need for designers to balance the development of new skills, such as prompting, programming and the management of large amounts of generated output, with the traditional, more hands-on skills of design. Furthermore, the literature emphasises the importance of supporting students' critical approach to GenAI, building their awareness of the ethical, societal and cultural risks inherent in generated outcomes.

While some scholars propose comprehensive restructuring of curricula (Davis, 2018), others favour more gradual, fluid adaptation (Kelly, 2018). What unites these perspectives is recognition that future communication designers will require both timeless and emerging skills—traditional practices such as composition and typography, alongside prompting, ethical reasoning, and management of large volumes of generated material.

The overarching challenge lies in balancing the opportunities of GenAI with the need for critical, culturally aware, and ethically grounded pedagogy. This study contributes to that conversation by exploring students' reflections on using GenAI in design processes—providing insights into how educators might meaningfully integrate these tools in ways that support both creativity and criticality.

3. Methodology

3.1. Research Design and Analytical Orientation

The study used a qualitative, exploratory case-study design to investigate how communication design students experienced and reflected on the use of GenAI within a

project-based assignment. The research is grounded in a constructionist epistemology (Burr, 1995), positioning students' reflections, interactions, and design artefacts as socially constructed accounts shaped by cultural, pedagogical, and technological contexts. Data were analysed using reflexive thematic analysis (Braun & Clarke, 2022), complemented by a semiotic examination of the visual outcomes, to provide insight into how students negotiated issues of aesthetics, factual accuracy, and cultural representation when working with GenAI tools.

The methodological aim was to produce an interpretive account of students' meaning-making processes, rather than to measure predefined variables or evaluate tool performance. This aligns with the study's broader pedagogical focus on how GenAI intersects with design cognition, reflection, and cross-cultural collaboration.

3.2. Researcher Standpoint

My approach to GenAI is critical–constructive, recognising the technology as a new design material capable of expanding ideation while also introducing ethical ambiguities, technical constraints, and risks of stereotype reproduction. As an educator and professional graphic designer, I acknowledge that my interpretation of the data is shaped by commitments to critical thinking, semiotic awareness, and the preservation of creative agency—values that influence how student reflections and outcomes are analysed. My aim is not to position GenAI as either a threat or a solution, but to critically examine how students engage with it, negotiate its limitations, and articulate its role within their design processes.

3.3. Study Context and Project Structure

The study was carried out collaboratively between Mälardalen University (MDU) in Eskilstuna, Sweden, and Curtin University (CU) in Perth, Australia, in September and October 2025. The project formed part of third-year, undergraduate design courses: *ITE356 Editorial Design—Project* (MDU, $n = 13$) and *GRDE3009 Visual Communication* (CU, $n = 45$). Students at each university worked in groups to design posters representing the city of their partner university. All visual material had to be generated exclusively using Adobe Firefly Image Model 4—the latest Firefly version available at the time of the study (released April 2025).

The project followed Kolb's (1984) principles of experiential learning, aiming to engage the students in an iterative cycle of learning, moving between reflection and conceptualisation as they interpreted and represented another city. Collaborative Online International Learning (COIL) (Amaral et al., 2023) served as a framework for an environment which would place students in a cross-cultural and collaborative context. The iterative nature of the project is also grounded in Schön's (1983) reflective practice,

as students developed their work through reflection-in- and on-action, fuelled by intercultural feedback and dialogue. Students met in five joint online sessions, shared iterative work on a Miro board, and conducted cross-cultural research discussions. The cross-cultural structure of the project is not treated as a primary variable of comparison, but as a productive condition through which issues of representation, bias, and interpretation become more visible.

3.4. Participants and Data Collection

The fact that the project was carried out in cities separated by 13,500 km and six time zones called for a flexible approach in the project's design. Five joint sessions were scheduled in the morning in Eskilstuna and late afternoon in Perth, and Microsoft Teams was used for the online meetings. Some technical issues were encountered, but for the most part the sessions ran smoothly. At both sites the Teams sessions were projected on large screens, with some of the students also accessing the sessions through their personal devices. Data for this paper were collected primarily from the MDU group, as these students were instructed to write weekly reflections as part of the course requirements. The following empirical materials form the basis of the analysis:

- Weekly student reflections: 4–6 short texts per student (100–200 words), submitted after each session.
- Group interview: A final reflective discussion with MDU students, documented by my own researcher notes and summarised.
- Observation notes: Researcher notes from all joint sessions and local work sessions, documenting prompting challenges, peer feedback, and design choices.
- Design artefacts: Twelve final posters, intermediate sketches, and mood boards created using Adobe Firefly.
- Cross-institutional interactions: Notes from student discussions during joint MDU–CU sessions.

The CU students did not submit written reflections in the same way, and the findings therefore predominantly reflect the perspectives of the MDU group. This limitation is acknowledged explicitly to maintain methodological transparency.

3.5. Ethical Considerations

All participants provided informed consent. Students were informed that participation was voluntary and independent of assessment. Data were anonymised during transcription and stored securely. Ethics procedures followed institutional guidelines for pedagogical research at both universities.

3.6. Data Analysis

Reflexive thematic analysis. The analysis of student reflections, interview data, and observation notes followed the six phases of reflexive thematic analysis (Braun & Clarke, 2022):

1. Familiarisation: Reading reflections, interview notes, and observational logs multiple times.
2. Coding: Generating inductive codes related to student experiences, frustrations, prompting strategies, cultural interpretation, and design judgement.
3. Generating initial themes: Collating codes into candidate themes capturing patterns in student meaning-making (e.g., factual instability, prompting literacy, creative control, cultural generalisation).
4. Reviewing themes: Refining and adjusting thematic boundaries to ensure coherence across data sources.
5. Defining and naming themes: Producing thematic descriptions emphasising conceptual insight over frequency-based reporting, in line with reflexive thematic analysis principles.
6. Producing the narrative: Integrating themes with literature and semiotic analysis in the Findings and Discussion sections.

Reflexive thematic analysis does not seek inter-coder reliability or consensus checking; instead, coding is treated as interpretive and situated, consistent with the constructionist perspective underpinning the study.

Semiotic and visual analysis of artefacts. To analyse the 12 final posters and intermediate sketches, a Barthesian semiotic framework (Holt, 2017; Skaggs, 2017) was applied:

- Denotation—literal visual content (landmarks, figures, landscapes).
- Connotation—cultural associations, stylistic cues, tonality, implied narratives.
- Myth—overarching cultural stories or stereotypes reproduced in the AI-generated imagery.

This lens allowed for examination of discrepancies between student intentions and GenAI outputs, particularly in terms of factual accuracy, cultural generalisation, and stylistic coherence. Insights from this semiotic framework are primarily reflected in the analysis of factual inaccuracies, cultural generalisations, and mismatches between intended and generated imagery presented in the Findings section.

Integration of multiple data sources. Themes were developed through triangulation of:

- what students *said* (reflections, interview)
- what they *did* (observations)
- what they *produced* (visual artefacts)

This approach provided a multi-layered understanding of student experiences, frustrations, and strategies for negotiating GenAI's constraints.

3.7. Methodological Limitations

The study is constrained by:

- a small sample of reflective data ($n = 13$)
- reliance on novice GenAI users
- limited duration (six weeks)
- restriction to a single AI tool and version (Firefly Image Model 4)
- absence of reflection data from CU students
- inherent subjectivity of reflexive thematic analysis

These factors shape the study's transferability and are further addressed in the Discussion.

4. Poster Designs—Conceptual Stages

The primary assignment tasked the Swedish students with designing posters representing Perth, while the Australian students created posters depicting Eskilstuna. Although students could choose a fictitious target audience—tourists, new businesses, or residents—all groups ultimately converged on solutions that were, to varying degrees, targeted toward tourists. All visual material had to be generated exclusively using Adobe Firefly, whereas the conceptual development drew on surveys, AI-generated mood boards, mood boards built from online research, and iterative peer feedback.

- Week 1: Joint session. Students from both universities were introduced to the project and to their partner groups. They completed a six-question survey about their own city, after which responses from MDU were distributed to the CU students and vice versa. Instructional resources for Adobe Firefly were provided, and students were encouraged to begin familiarizing themselves with the tool.
- Week 2: Joint session. Using the survey responses as prompts, students at both universities created initial mood boards with Adobe Firefly and posted them on a shared Miro board.
- Week 3: Joint session. Students expanded their research using online sources and discussions with their partner groups, generating imagery, text, and stylistic references to refine their mood boards.
- Week 4: Joint session. Each group presented two initial poster sketches on the Miro board and exchanged peer feedback.
- Week 5: Local sessions. Students worked separately at their respective universities, developing the final versions of their posters using the feedback received.

- Week 6: Joint session. Final posters were presented on the Miro board (see Figures 4–15).

During the second session, students presented their first mood boards generated entirely with Adobe Firefly. Many described the experience as "going in blindly," noting the difficulty of generating imagery for places they had little prior knowledge of. The initial outcomes were often described as stereotypical or generic. As one student put it: *"we struggled with the depicted persons' proportions and the fact that they sometimes seemed to be missing body parts or conversely having too many of them"* (student 1, author's translation).

Peer discussions highlighted that the GenAI tool frequently produced fictionalised representations of both cities, reinforcing generalised or archetypal ideas of Scandinavia and Australia. Notable examples included recurring mountain landscapes in images of Eskilstuna—despite the region's flat geography—and quokkas appearing in images supposedly depicting Perth, even though these animals primarily inhabit islands off Australia's west coast (Figure 1). These early results underscored the need for at least minimal factual familiarity with the subject matter to guide the GenAI outputs effectively.

In the third session, students were asked to refine their material by incorporating both feedback and additional research. Many attempted to produce imagery with greater

Figure 1. Team 12's initial mood board.

Figure 2. Team 11's drafts.

specificity, hoping to move toward more accurate depictions. Yet reflections reveal continuing difficulties: hands with too many fingers, child-like characters substituted for adults, and limbs positioned unnaturally. Attempts to correct these issues through prompting often made them worse or produced equally implausible alternatives. One student observed: *"I have also noticed that the faces of background figures lack detail; eyes and mouths are barely distinguishable in the images generated by Firefly"* (student 5, author's translation). Despite these challenges, some groups managed to generate imagery that captured at least broadly recognizable geographic elements, forming a starting point for their poster concepts (Figure 2).

By the fourth session, students presented two developed poster sketches (Figure 3). Many again expressed frustration with the challenge of shaping GenAI outputs to align with their intentions. Groups reported inconsistencies in how the system responded to prompts or partial disregard of instructions. As one student remarked: *"We noted that the AI tool had difficulty when it came to negations; even though I specifically prompted 'no mountains' it included mountains in all the images, continuing to do so in my second attempt"* (student 4, author's translation). Both Swedish and Australian students described similar issues—struggling to remove incorrect geographical features or adjust image perspectives. The AI's unpredictability led some to describe it as having "*a mind of its own*" (student 8, author's translation).

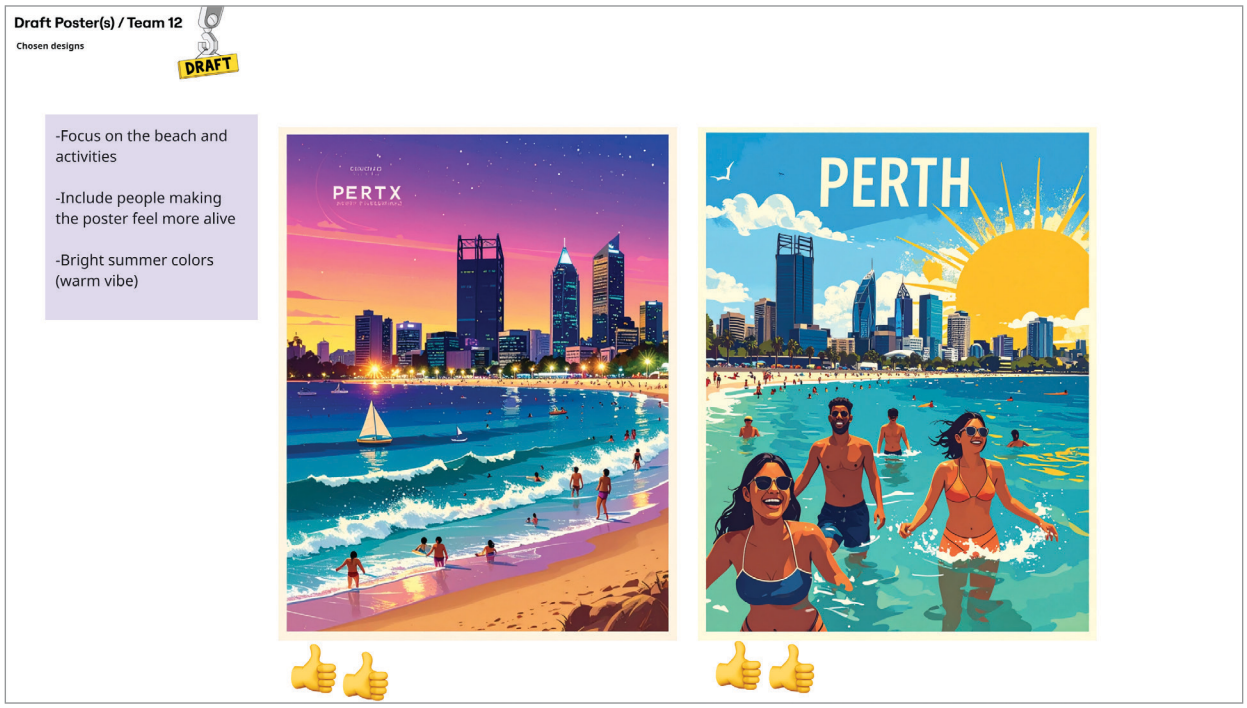

Figure 3. Team 12's poster sketches.

In Week 5, students worked independently to finalise their posters. They selected one of their sketches and were allowed to combine generated elements and add text, but they were not permitted to create any imagery manually. Groups continued to engage with their partner universities and received instructor feedback as they shaped their final outcomes.

5. Poster Designs—Final Outcomes

5.1. Aesthetics

In the project's final session, groups presented their completed posters. All groups opted for colour versions of their designs, with the least saturated design being a two-tone winter cityscape (Figure 6). Feedback from earlier sessions influenced aesthetic refinements, resulting in more accurate depictions of skies, clouds, and overall tonal balance.

In terms of visual style, approximately half of the groups adopted retro-inspired aesthetics reminiscent of earlier design eras (Figures 6–9, 12, and 13). Three groups developed vector-style illustrations (Figures 7, 8, and 10), one group produced a somewhat romanticised hand-drawn style (Figure 1), and two groups maintained photorealistic approaches (Figures 5 and 14).

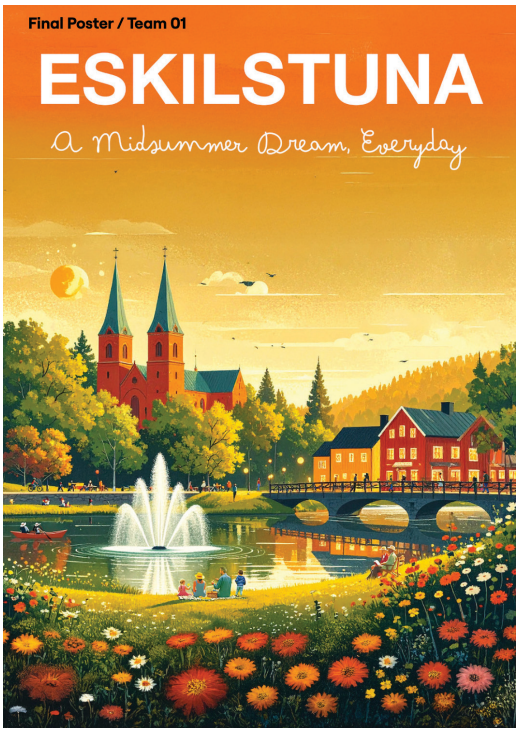

Figure 4. Team 1's poster design.

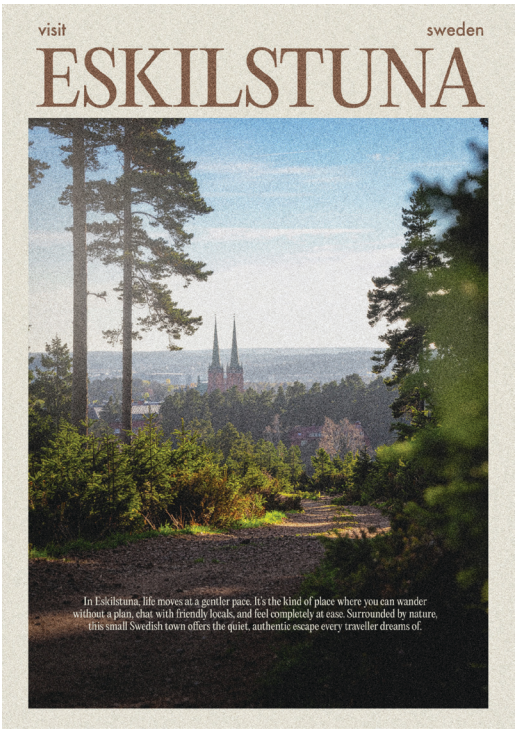

Figure 5. Team 2's poster design.

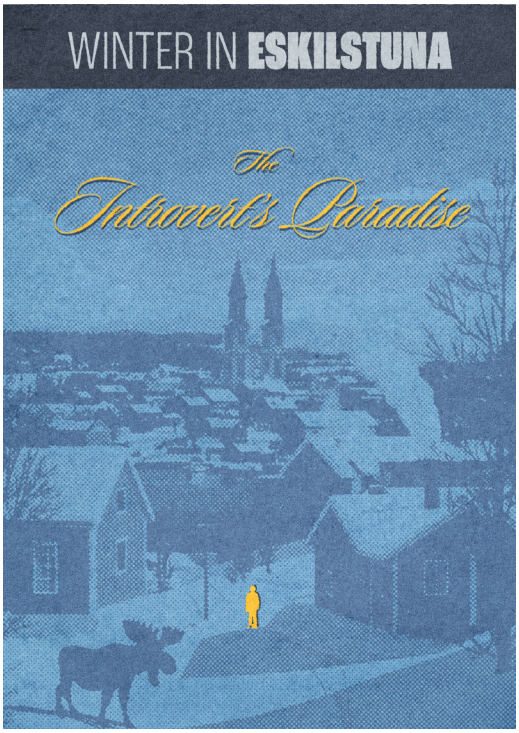

Figure 6. Team 3's poster design.

Figure 7. Team 4's poster design.

Figure 8. Team 5's poster design.

Figure 9. Team 6's poster design.

Figure 10. Team 7's poster design.

Figure 11. Team 8's poster design.

Interestingly, most groups initially experimented with photorealistic imagery but later pivoted toward illustration-based styles—nine out of twelve final posters used illustration rather than photography. Students explained that illustration allowed them to evoke a sense of place without needing to resolve specific details or achieve strict visual accuracy. As one student reflected: *"…it is less forgiving to use photo-realistic images, as you expect them to correspond to reality"* (student 3, author's translation).

Discussions also revealed the cognitive effort required to select and refine AI-generated material. Students mentioned the frustration of not being able to arrive at outcomes corresponding to their ideas and mental images, while also acknowledging their own lack of experience with GenAI tools. They furthermore recognised that both theoretical and practical design skills were crucial for guiding the generative process and achieving acceptable results.

5.2. Factual Accuracy

A consistent challenge across all groups was managing factual inaccuracies generated by the AI. Students encountered animals not native to the depicted regions—such as quokkas appearing in Perth images and reindeer in Eskilstuna—alongside non-existent geographical features like mountains and beaches appearing in incorrect contexts. From a semiotic perspective, many of the inaccuracies observed at the denotative level (e.g., misplaced landmarks, incorrect fauna) disrupted the intended connotative meanings of the posters.

To navigate these issues, many groups chose to move away from specific details and toward more general atmospheres or symbolic representations. Attempts to depict people engaged in recognizable activities, such as playing a guitar, often failed due to distorted anatomy or unnatural body positioning.

Despite these challenges, students felt compelled to include certain key elements—landmarks, nature, or architectural fragments—to situate their posters. Swedish students attempted to generate images of the Perth skyline, while Australian students repeatedly turned to Eskilstuna's iconic twin church towers. Yet achieving an accurate representation proved difficult.

Additional difficulties arose when GenAI added unwanted elements: Union Jack ribbons appearing in response to "wavy frame" prompts, or failure to produce classic "postcard style" layouts. Students experimented with alternative prompting strategies but reported mixed success.

The end results generally conveyed broad connotative impressions—"a European town" or "an Australian city"—rather than precise depictions. Although this type of general-

Figure 12. Team 9's poster design.

Figure 13. Team 10's poster design.

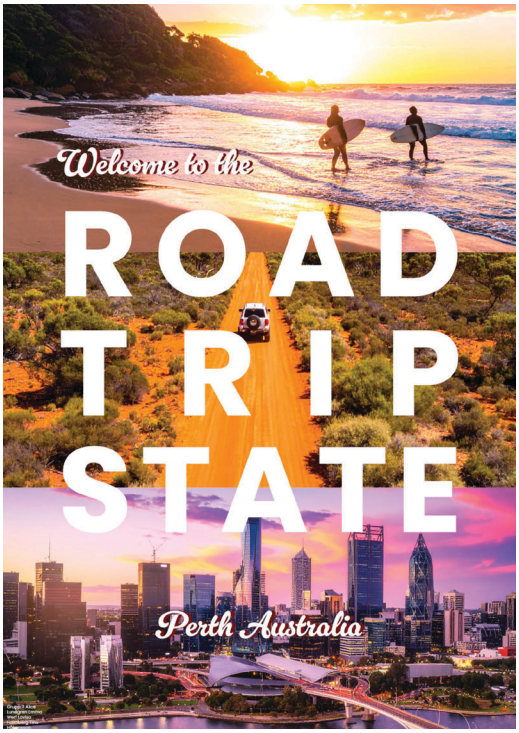

Figure 14. Team 11's poster design.

Figure 15. Team 12's poster design.

ization is not unusual in tourism-oriented material, the vagueness here stemmed from the GenAI system's limitations, rather than from deliberate design choices.

An important limitation of the assignment was the omission of a specific audience. While the groups all ultimately chose to focus on tourists, a more defined profile of the intended audience might have informed and shaped the outcomes better, avoiding generic visual qualities. Future iterations of the project would benefit from a more defined audience group, perhaps resulting in material of higher communicative quality.

5.3. Cultural Aspects

Through peer feedback and iterative refinement, groups were able to incorporate at least some cultural markers into their posters. For Perth, this included references to ocean proximity and an active, outdoors-oriented lifestyle (Figures 14 and 15). The Eskilstuna posters more frequently communicated a sense of smaller-city calm, historical character, and closeness to nature (Figures 5 and 7).

Students found it challenging to depict culture with specificity, again gravitating toward more symbolic or atmospheric cues. Misalignments often occurred between student intention and GenAI interpretation. For example, prompts such as "recycling" yielded images of trash cans or landfills, and "industry" produced outdated imagery like smoking chimneys.

Cross-cultural differences also influenced interpretations. Students in Eskilstuna (population ~70,000) struggled to relate to Perth students' description of their 2.3-million-inhabitant city as "small," contributing to differences in visual and conceptual emphasis between the two groups. Despite this diversity, both cities are culturally and ethnically varied, making it striking that all posters reflected predominantly Western and Caucasian norms. The absence of student commentary on this highlights how generative systems can reproduce colonial imaginaries even in multicultural and Indigenous contexts, and underscores the need to strengthen students' critical engagement with such biases.

5.4. Final Remarks

In their final reflections, students emphasised how challenging it was to generate imagery that matched their intentions: *"...it's been hard to get AI to do as you want... like adding details to images, such as swans or small boats"* (student 5, author's translation). They described difficulties producing coherency in the outputs, inconsistencies between identical prompts issued at different times, and challenges building upon promising but flawed outcomes. Several attributed these issues to their lack of experience with GenAI, though they also acknowledged limitations inherent in the tools.

Students repeatedly recognised that solid design skills remained essential for guiding the generative process and mitigating erratic or stereotypical outcomes. At the same time, they identified valuable aspects of GenAI—particularly its ability to generate large numbers of variations quickly. Some even likened unexpected or inaccurate outputs to analogue "happy accidents," capable of sparking new ideas and shifting their perspectives.

It is important to acknowledge that the use of Adobe Firefly (Image Model 4) shaped the outcomes underlying this study. Other GenAI tools and later iterations of the model offer more advanced results, and future studies should compare multiple tools to further develop our understanding of student interaction with GenAI. A conference workshop is planned for autumn 2026 which will be inspired by this project, which will offer the possibility to compare different GenAI tools and hopefully reveal further insights about the nature of their outcomes.

6. Discussion

This study set out to explore design students' experiences of using GenAI within a cross-cultural, project-based design assignment. The reflections and discussions generated throughout the project reveal a nuanced combination of curiosity, frustration, creative experimentation, and critical awareness. The findings align with earlier research positioning GenAI as a promising yet unstable design partner—one that expands conceptual exploration while simultaneously exposing significant limitations.

Students from both universities described GenAI as a powerful tool during the ideation phase. The ability to rapidly generate large quantities of visual material supported divergent thinking and enabled groups to test stylistic alternatives quickly, resonating with Seidel et al.'s (2018) description of the "triple-loop" process in which designers iteratively evaluate and modify machine-generated outcomes. Students also noted instances in which unexpected results—what some compared to analogue "happy accidents"—supported shifts in perspective and encouraged the exploration of new visual directions.

However, the project also brought forward clear limitations of GenAI. Many students struggled to align the generated imagery with their conceptual intentions, particularly when attempting to refine details or produce visually accurate representations of unfamiliar locations. Errors such as distorted hands, unnatural body positions, missing or incorrect landmarks, and inconsistent stylistic features were repeatedly described as sources of frustration. These challenges echo concerns raised in the literature about the persistence of inaccuracies, biases, and inconsistencies in AI-generated imagery (Bianchi et al., 2023).

The project's cross-cultural structure intensified these issues. Students were tasked with representing cities they had never visited, relying initially on GenAI to construct a visual understanding of Perth or Eskilstuna. Yet the results were often stereotypical or factually incorrect, leading students to question the reliability of GenAI as a research tool. For example, Swedish students struggled to remove beaches from images of Perth, while Australian students were repeatedly presented with mountain ranges around Eskilstuna. These inaccuracies support Hwang and Wu's (2024) argument that GenAI poses contextual and cultural risks, especially when used without sufficient background knowledge.

As the project progressed, many groups shifted toward less literal, more stylised visual approaches—such as vector illustrations, retro aesthetics, or symbolic compositions—to circumvent GenAI's tendency toward factual distortion. This move away from specificity toward abstraction was not an initial conceptual decision but rather a practical adaptation to the technology's constraints. This reflects Omran Zailuddin et al.'s (2024) concern that GenAI's generative power can sometimes narrow rather than broaden creative exploration by forcing students toward generality.

Throughout the project, students expressed a heightened awareness of the importance of their foundational design skills. Their reflections suggest that without strong abilities in composition, colour, typography, semiotics, and visual analysis, it becomes difficult to interpret or steer AI-generated content meaningfully. This observation aligns with Saéz-Velasco et al.'s (2024) argument that foundational skills remain essential for avoiding homogeneous or biased outputs, and with Marble's (2025) insistence that students must develop independent design judgement before relying on GenAI.

The project also encouraged students to critically consider their own agency within AI-mediated workflows. Several reflected on whether GenAI might undermine human creativity or whether its outputs risk flattening cultural nuance—concerns echoed in broader discussions about the changing nature of design labour (Gray, 2024; Pratschke, 2024). The students' recurring descriptions of GenAI as having "a mind of its own" further point to Latour's (1999) notion of black-boxed technologies and the opacity of automated systems.

These findings also connect to broader concerns about the conditions under which future designers will enter the profession and the shifting technological infrastructures that shape creative work. In this context, it is also important to consider that we are still in the early stages of a society-wide adaptation to AI—an adaptation currently facilitated by the widespread availability of tools that are often accessible through institutional licensing or limited free-use tiers. This accessibility enables designers and students to experiment with GenAI without significant financial barriers. However, as generative technologies become more deeply embedded in commercial ecosys-

tems, there are indications that some business models may shift toward proprietary ecosystems, subscription structures, or platform consolidation. This trajectory aligns with Doctorow's (2025) critique of the "enshittification" cycle, in which digital systems gradually transition from user-focused to increasingly restrictive as market power consolidates. Adopting a forward-looking stance is therefore essential, to support alternative paths of development, where open-source models and less centralised AI ecosystems can emerge. Without such awareness, designers risk becoming dependent on tightly controlled platforms in ways that may constrain their creative autonomy, limit independent decision-making, and reduce flexibility in future design practices.

A recurring theme across the students' reflections was the need for more structured opportunities to develop critical evaluative skills when working with GenAI. While the project introduced reflective writing and peer critique, the open-ended nature of these activities meant that students often focused on surface-level frustrations rather than deeper questions about assumptions, cultural framing, authorship, and design intent. More scaffolded reflection prompts—focusing on what the tool did well, where it failed, what assumptions guided the prompting, and how alternate strategies might have changed the outcome—could have supported richer, more rigorous forms of critical engagement. Embedding such scaffolding is particularly important in an AI-augmented design environment where tools can mask their own biases and where students must develop confidence in questioning outputs rather than accepting them at face value.

These findings also connect to the question of how design education can prepare students for an uncertain and rapidly evolving professional landscape. As GenAI becomes increasingly integrated into industry workflows, entry-level design tasks may change or diminish, placing greater emphasis on students' ability to adapt, critically evaluate outputs, and identify opportunities where human judgement remains essential. The ethical responsibility of educators extends beyond introducing specific tools; it involves equipping students with durable capacities—critical thinking, conceptual clarity, reflective judgement, and cultural awareness—that will remain relevant regardless of how GenAI continues to develop.

Ultimately, the findings reinforce the idea that using GenAI effectively requires not only technical skill but also critical reflection, ethical awareness, and a strong sense of design intent. The project helped students articulate these needs explicitly, demonstrating the potential of project-based learning to support reflexive engagement with emerging technologies. With regard to these insights, several implications for design educators navigating the integration of GenAI into communication design curricula can be gained:

Reinforcing foundational design skills as a prerequisite to effective AI use. Students emphasised that without strong skills in composition, colour, typography, and semiotics, it was difficult to evaluate or steer GenAI outputs. This highlights the importance of guiding

students to view GenAI not as a source of ready-made designs, but as a complementary tool that both depends on and underscores the importance of traditional design competencies. Such an approach puts the human input and creativity first, instead of the tool itself.

Teaching prompting as a critical, iterative design practice. The students struggled with inaccurate or unwanted outputs which did not correspond with the imagery they had in their minds, which shows that prompting is not a mechanical task but a form of conceptual articulation. Helping students develop more precise, reflective prompting strategies through iterative practice could be a way to develop the ability to link prompts to visual outcomes and encourage iteration.

Embedding critical thinking and ethical awareness into GenAI activities. Stereotypes, factual errors, and culturally flattened representations were encountered by the students throughout the project. Structured reflection on these outputs can help highlight issues of bias, representation, and authorship, positioning GenAI as a tool to interrogate rather than merely to use. This is of course a central point in design education already, but now perhaps an even more important aspect than ever before.

Supporting students in managing abundance and ambiguity. The vast quantities of material generated by GenAI risks overwhelming students or leading to superficial selection. Educators can help students develop filtering criteria, selection strategies, and reflective decision-making processes that foreground intentionality.

Encouraging cross-cultural and contextual understanding. Because GenAI often produces generic or stereotypical imagery, design tasks that require cultural sensitivity can reveal the limits of the technology and the importance of context-driven research. Educators might incorporate collaborative or cross-regional projects to strengthen students' interpretive awareness.

Maintaining analogue and tactile practices alongside AI-augmented workflows. Students' reflections underscore that embodied design experiences—working with materials, tools, and physical processes—continue to shape critical judgement in ways GenAI cannot replicate. Integrating AI into curricula should not come at the expense of these traditional modes of exploration.

Presenting GenAI as part of a broader ecosystem of design tools, not a replacement. Educators can help students cultivate a balanced perspective in which GenAI is understood as one material among many—useful for broad exploration but limited in precision, cultural nuance, and aesthetic intentionality.

7. Conclusion

To summarise, this study both supports and extends existing research on the topic of GenAI in design education. Confirming prior work, its outcomes support the importance of developing strong foundational skills and critical awareness when using GenAI tools. Simultaneously, the study presents new insights into students' experiences of the tensions between their expectations and outcomes of GenAI, especially where issues of factual accuracy and representation are amplified. The role of reflexive practice is a key finding, highlighting students' ability to evaluate, question and reinterpret GenAI outcomes in order to maintain creative agency. Reflexivity can hence be seen not as an auxiliary skill, but as a core design skill needed to navigate current and future technological and cultural conditions.

The scope of this study was deliberately limited, and the students' difficulties can partially be attributed to their relative inexperience with GenAI. With more familiarity, it is likely that many of the frustrations they encountered—particularly around prompting and refining outputs—would diminish. Nevertheless, their reflections offer valuable insight into how students understand GenAI's role in design practice and how they negotiate its benefits and shortcomings.

The findings support earlier arguments that GenAI can assist with ideation and conceptual exploration, particularly when designers treat its outputs as starting points rather than finished proposals. At the same time, the results highlight the need to maintain traditional design skills, echoing concerns that over-reliance on AI could lead to homogenous outcomes, reduced creative agency, or the erosion of aesthetic judgement (Ray, 2023; Xu et al., 2019). More broadly, the project demonstrates that GenAI can serve as an effective catalyst for reflection, pushing students to articulate their conceptual intentions, question algorithmic tendencies, and recognise the value of their own creative and critical capacities.

As with any pedagogical case study, the conclusions drawn here are specific to the context in which the project was conducted. The short duration, the small number of participating students, their novice familiarity with GenAI tools, and the use of a single image-generation system all limit the generalizability of the findings. Moreover, the reflective data collected from students was shaped by their individual levels of confidence and their prior design experience. These limitations do not diminish the value of the insights obtained but instead clarify that they should be viewed as indicative rather than definitive, pointing to areas where further research and long-term pedagogical exploration are needed.

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