

# Negotiating the New: Finding The Common Ground To Integrate AI into Early Applied Design Education for Industry Readiness

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## ABSTRACT

How can AI support creativity without compromising foundational skills in design education? This study reports on an educational innovation grant project conducted in a first year interior design course at Petra Christian University. AI was introduced not as a design generator but as an ideation partner. Students began with manual sketching based on field research of historical architecture in Surabaya's Old Town. They gradually learned to enhance their sketches using free AI tools (ChatGPT, Gemini, Canva, and Photopea). Collaborative work with fashion design students aimed to add contextual narrative layers for users and reinterpret Art Deco elements into spatial and wearable concepts. The research was conducted in a mixed-method design by observing design thinking applied in both studios while incorporating AI in the design process, peer review to enhance collaborative design development between 2 studios, and quantitative evaluation through a questionnaire. The questionnaire was disseminated as a post-studio evaluation and completed by 54 students from both studios. Findings from the questionnaire and instructors' observations indicate that, rather than diminishing creativity, AI has helped students gain clarity in early design decisions and encouraged the intentional use of manual techniques. However, challenges remain in students' prompt-building capabilities and understanding of scale, interior spatial senses, fashion details constraints, and authorship in AI-generated images. This paper reflects on the pedagogical implications of AI as both opportunity and disruption, advocating for a balanced, human centred curriculum where technology serves—but does not replace—designer intuition.

**Keywords:** *design pedagogy; AI integration; human-AI co-creativity; prompt literacy; industry readiness*

## INTRODUCTION

Artificial intelligence (AI) has become an everyday remedy to overcome all time consuming processes of a modern design studio (Cooklin-Lofting, 2025). In recent years, the rapid development of AI has significantly improved, or in some cases altered, creative industries' processes, including architecture, fashion, and interior design. From automated rendering to generative design tools, AI has presented opportunities and challenges for design pedagogy (Karadağ, 2025).

Design has been widely taught in different methods, including interior, architecture, visual communication, and fashion design, using project-based learning in a studio setting to bring an experience as close to what it is like in a professional design setting. While higher level studio courses have begun experimenting with these tools, less attention has been given to how AI might be integrated into foundational design education, particularly for students without design experience. Instead, many educators revolve around the ethical issues of using AI (Iyer, 2025).

Architecture and interior design education have changed from the past to the present due to social and cultural shifts, worldwide concerns, and technical advancements (Özorhon, 2025). From the foundational principles of applied design to the AI-assisted design techniques of today, design education has always been demanded to evolve to meet new demands and seize new opportunities. The design studio is at the heart of this development, a vibrant setting that encourages creativity, problem-solving, and teamwork (Özorhon, 2025).

This paper emerges from an experimental teaching practice conducted in the first year of the Interior Design Department in collaboration with the Fashion Design and Textile program at Petra Christian University, Indonesia. Specifically in the Visual Presentation (VP) for Interior Design and Fashion Graphic (FG) classes. Both classes are conducted in a design studio model, where the class is performed in a project-based education system based on the master-apprenticeship relationship. It aimed for students to conduct problem-oriented research with expert designers and peers and gain solution-oriented design experience (Taşçı, 2016). As part of an educational innovation grant, a project was initiated to explore how AI tools could be integrated into the early stages of the design studio, embedded in the design thinking process, without undermining traditional methods such as sketching, spatial programming, and manual ideation. The goal of collaboration between these two basic studios are to introduce history of design as part of design basic for both, to provide real life visual experience in mapping design elements through historical approach, and to put user needs in context as a base for their design development in interior design and fashion.

The integration and collaboration put more emphasis on instruction rather than technology. The main goal was to redefine AI as an ideation partner rather than a solution supplier. Free AI tools like ChatGPT, Gemini, Canva, and Photopea were presented to students as a tool to help them visualize ideas from their initial on-site research and manual analyses (Karadağ,

2025). The multidisciplinary partnership with fashion design students, which focused on Art Deco architecture as a source of aesthetics and narrative inspiration, further enhanced this endeavour.

The central concern guiding this research is: how can AI be introduced in early-stage design education in a way that supports, but does not replace, the cognitive and intuitive processes of design thinking? This paper discusses the pedagogical structure, student responses, challenges observed, and the implications for design education in the age of AI. Therefore, this paper explores how generative AI can support interior and fashion design pedagogy, particularly in fostering ideation, narrative development, and early-stage design thinking. It also identifies pedagogical challenges and reflects on the conditions required for effective integration within foundational design education.

## LITERATURE REVIEW

### *AI in Architecture and Interior Design*

AI has been advancing swiftly, while the construction sector is encountering three key trends: industrialization, sustainability, and digital intelligence (Li et al., 2025). AI technology has been used in the field of architectural design due to its impact on design efficiency. Artificial intelligence holds significant promise in the process of architectural design, encompassing artistic development, analysis of data, and solutions to problems. Furthermore, AI has various uses across the entire building lifecycle, including forecasting analytics, oversight of construction, and maintenance of facilities (Li et al., 2025).

In the realm of architectural design, AI not only enhances workflows by facilitating information exchange but also significantly boosts the efficiency of organizing tasks through advanced computational abilities. Regarding information exchange, AI algorithms like Pix2Pix, a product of conditional Generative Adversarial Networks (GAN), alongside an interactive sketch program based on Convolutional Neural Networks (CNN), can translate sketches into architectural drawings or models (Li et al., 2025). When paired with virtual reality, architects can fully immerse themselves in and alter designs within a virtual setting. Furthermore, augmented reality and mixed reality technologies create connections between the real and virtual realms, further enhancing the optimization of information exchange. For task organization, breaking down and structuring architectural design tasks is essential for achieving efficient design workflows. AI assesses the flow of information through the Design Structural Matrix (DSM) and refines the intricate matrix with heuristic algorithms such as clustering and genetic algorithms, aiding in the formation of cohesive task modules, minimizing information loss, and enhancing design workflows (Li et al., 2025).

Syed (2024) underscores the increasing importance of AI in the constructed environment, stressing the necessity for designers to grasp both its possible advantages and

drawbacks. AI provides significant benefits in the design process, such as enhancing creativity via generative design, where algorithms quickly produce a variety of options within defined parameters. It further improves efficiency by automating routine tasks and refining designs using data-driven insights related to structure, materials, and energy consumption. Additionally, AI enhances sustainability through the analysis of environmental data to suggest eco-conscious materials and energy-saving approaches. Finally, AI enables cooperation among various fields via real-time data-sharing platforms, enhancing coordination, minimizing mistakes, and resulting in more cohesive and successful project results.

Syed (2024) also points out numerous difficulties related to integrating AI into the design process. A significant issue is the danger of depending too much on algorithms, potentially reducing designers' creativity and intuition, leading to less human-focused results. Concerns regarding data privacy and security emerge as AI systems manage extensive amounts of sensitive project data, creating possible threats to confidentiality and intellectual property. Moreover, the monetary investment and adjustment phase needed to adopt AI tools can be challenging, especially for smaller companies that encounter training and expense obstacles. Ultimately, ethical concerns arise concerning algorithmic bias, responsibility for AI-driven decisions, and the ethical ramifications of AI-created designs, highlighting the necessity for responsible and inclusive technology application in design work.

### ***AI in Fashion Design***

In July 2024, Elon Musk made a significant impact by releasing an AI-generated fashion video on the X platform (Lola, 2024). AI has swiftly emerged as a transformative influence in multiple industries, with the fashion industry quickly embracing this shift. AI has transformed all facets of business, including design, marketing, sales, and modelling, offering companies new avenues to enhance their operations and achieve unparalleled success.

In a landscape where flexibility and creativity are essential for achievement, AI has the potential to transform various elements, including product design and personalized fashion suggestions for customers. It can help create new clothing items, even to the extent of generating unique designs, and offer vital insights like anticipated trends (Kouslis et al., 2024). The coronavirus pandemic has accelerated the growing dataset and change of consumption behaviour to highlight the need for flexibility and 24/7 ready service provided by embedding AI in the system.

As with any new technology, the incorporation of AI in the fashion industry brings about its own challenges and raises worries regarding job losses and the possible diminishing of creative expression. For example, the emerging AI fashion model is possibly shifting the utility of conventional models (in this case, humans). However, Cyril Foiret, the founder of Maison Meta - Gen AI campaign and marketing agency, argues that there is minimal reason for concern (Lola, 2024).

In the fashion industry, there are three essential skills that must be acquired by a fashion design student: design skills, pattern-making skills, and sewing skills (Khairulanwar, 2025). The use of AI is explored specifically to enhance the design skills before carrying out the production phase. Upon the case study researched, the design skills incorporating AI can serve as the foundation for garment creation and provide students with a competitive edge in the fast paced and ever-evolving fashion market. This skill also empowers students to unleash their creativity, devise original designs, and respond to the demands of the global industry. These skill sets are essential for them to find their way in utilizing AI, and in order to survive the vast and fast-paced fashion industry. Moreover, Jin and Lee (2024) assert that generative AI supports and enriches the ideation stage of fashion design by offering diverse and sometimes unexpected visual outcomes. The quality of these outputs is governed by prompt engineering: the more detailed the prompts, the more accurate the visualizations, yet this can unfortunately chain creativity. Meanwhile, leaving some prompt elements indefinite spawns surprising and inspiring results, which is why the Human-AI design development needs to be put under scrutiny. It also demonstrated a demand in the fashion industry for advancements in generative AI technology that address the peculiar challenges and specifications of fashion design, empowering designers to employ technology creatively and effectively.

Therefore, the gap in the fashion industry that can be optimized by incorporating AI, such as:

- **A more immersive pre-production experience.** AI may effectively improve learning in fashion design by offering visual aids and instructional resources that enhance understanding of design principles.
- **Creative design methods.** AI algorithms forecast trends and evaluate customer preferences, enabling fashion companies to develop in-demand designs and minimize the likelihood of excess inventory, promoting innovative and market-oriented creations.
- **An adaptable, welcoming, and tailored setting.** Models created by AI allow businesses and students to explore a variety of model representations, fostering inclusivity by showcasing individuals of different shapes, ethnicities, genders, and sizes, in line with the brand's values and mission.
- **An extensive data set to explore.** Utilization of AI broadens access to design-related information, enabling students to better explore and develop their creative ideas. Consequently, AI creates a more engaging and profound learning experience, ultimately leading to higher-quality fashion designs.
- **Embrace a never-ending learning cycle, especially from the instructor.** Fashion instructors typically view the integration of AI positively, recognizing its ability to enhance teaching methods and boost students' design skills.
- **Sustainability and efficiency in cost and time.** Digital processes decrease waste and lower material costs as well as resources used for on-site shoots. While the upfront investment in developing AI models can be significant, long-term savings

are realized through lower promotional costs and the capacity to repurpose models across various campaigns.

However, there are also some challenges to be aware of, such as:

- **Effects on human creativity.** Relying on AI to produce designs rather than utilizing human creative talent doesn't seem to have a favourable outcome. The innate creativity of talented individuals has consistently been the inspiring force behind stunningly beautiful fashion designs and modelling throughout history. Future research should focus on refining human-AI collaboration frameworks for fashion, education, and innovation.
- **Risk of uniformity.** Relying on AI for design and marketing choices may create a more uniform fashion industry, diminishing both uniqueness and creativity. This uniformity could lead to a decrease in the quality and attractiveness of fashion items.
- **Technical constraints, value-related issues, and limitations in resources.** Overcoming these obstacles involves increasing access to AI resources, boosting digital literacy among both teachers and learners, and incorporating AI-based approaches into the educational curriculum to maximize its benefits in fostering creativity.
- **Impact on human financial and social stability.** AI is rapidly “complementing” – and in some cases replacing – human workers. The possible elimination of jobs may have a considerable impact on the fashion sector, the larger economy, as well as people’s well being and social stability.

### ***Higher Education Design Studio Pedagogy Alignment to Industry Needs in AI Era***

As traditional studio teaching shifted online, the design education landscape changed dramatically. This transformation coincided with industry expectations for adaptive, technologically adept graduates who could work and collaborate in a decentralized workforce. Since the onset of COVID-19 in 2020, there has been a significant increase in the adoption of online technologies for studio teaching. An increasing number of design educators are integrating online components into their design curricula. Pre-recorded lectures, online feedback and criticism sessions, self-paced learning exercises, and the usage of cloud-based collaborative tools are some of the most popular ways. This adjustment demonstrates a forward-thinking strategy to better align design education with industry (Fleischmann, 2024).

Designers today frequently work in diverse teams and engage in interactive design approaches that extend beyond traditional client engagements. Ideas are no longer confined to a single domain of knowledge but may expand beyond and cross disciplinary. Designers are increasingly expected to demonstrate empathy, human-centred awareness and able to work with people and for people more than before. Ironically, the increasing use of technology is higher and faster in students’ education to become professional

designers. Moreover, the COVID-19 pandemic has propelled the decentralized collaborative approach via the internet even more. Although the distributed online work environment is becoming the "new normal" in the design industry, some design educators are still hesitant to completely embrace online technology, as they find physical meetings still beneficial in design studio teaching (Fleischmann, 2024). This reluctance to teach design online has encouraged some design researchers and educators to suggest that design education is trapped in the past and does not always reflect market realities (Sopher et al, 2019).

Adapting design curricula to meet industry needs remains a persistent challenge. "The pace of technological change in the design industry requires university curricula to continually adapt, with curricula planned for future employment possibilities" (Crosby et al., 2020). While traditional design education has some advantages, it falls short of fulfilling current demands (Meyer & Norman, 2020). Since the digital revolution, design curricula have struggled to keep up with advances in desktop computing, internet platforms, and, most recently, generative artificial intelligence (AI).

As AI advances, its strategic integration into the design studio process will be crucial to ensuring that it complements rather than overshadows the design studio. With appropriate guidance and careful implementation, AI generators can improve design learning by widening students' creative potential and facilitating adaptation to new techniques (Karadağ, 2025; An & Park, 2023). The fast development of AI algorithms creates both great opportunities and inherent difficulties. Future studies could focus on adapting AI to specific students' learning methods, leading to more tailored experiences. Given the shifting methods designers work with, today's graduates must have adaptable abilities to flourish in the decentralized design field. Due to this understanding, this research was conducted to enable students to harness important skills to make them more empathetic, human-centred, and adaptive to change. These skills include (Fleischmann, 2024):

- Independent learners with a desire to pursue lifelong learning.
- Adaptable to new technology.
- Effective communicators on collaborative online platforms.
- Business acumen includes project management know-how and entrepreneurship

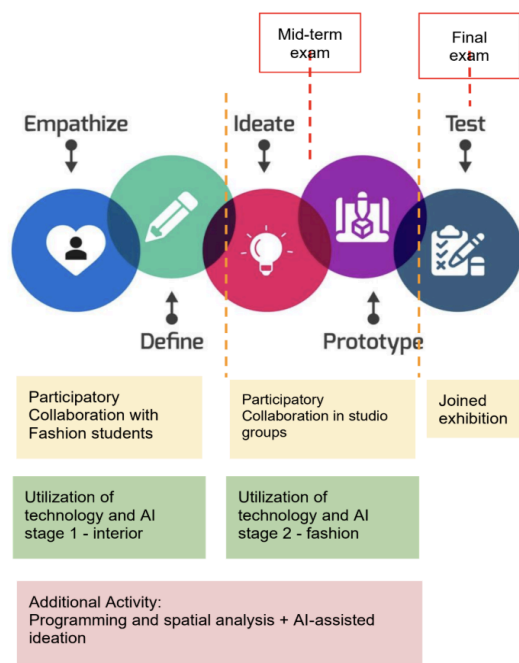
## **METHODOLOGY**

This research utilized a design thinking framework along with an experimental teaching method to explore how the incorporation of AI could improve ideation in early design education. Design thinking was chosen as the core mindset due to its focus on iterative problem-solving, empathy-led inquiry, and visual reasoning—skills considered fundamental for first-year interior design students.

The implementation was structured into two main workshop phases. The first focused

on analogue programming and spatial analysis using manual tools such as bubble diagrams, enabling students to identify site-specific issues and user needs. The second introduced generative AI tools (ChatGPT, Gemini, Canva) as ideation aids, followed by reflective selection, manual redrawing, and technical adaptation using tools like Photopea. Participants included second-semester interior design students and collaborating fashion design students. Data were collected through a Likert-scale questionnaire and open-ended reflections to evaluate effectiveness, learning outcomes, and perceived challenges.

The intervention was carried out over 14 weeks within the visual presentation course, which is a component of the Interior Design program at Petra Christian University. This course aimed to lead second-semester students, most of whom lacked previous design experience, through a sequential exploration of spatial ideas, user requirements, and visual narration. The partnership with Fashion Design students was intended to contextualize the visual elements and offer an opportunity for students to work together and reconcile needs with design ideals. They are divided into small groups of 4-5 students, consisting of 3 interior design students and 1-2 fashion design students. A total of 68 students from both classes joined the process (50 interior students + 18 fashion students).



Source : Processed by the Authors (2025)

The module followed the five stages of design thinking:

1. **Empathize** – Students conducted observational and contextual studies of historical architecture in Surabaya Old Town in early February 2025. They were asked to

document interesting building elements that could potentially be developed in their design later on.

2. **Define** – In this stage, interior design students and fashion design students need to settle on a design baseline of specific user characteristics, colour palette, and design elements to be used by both classes in the same group. Using manual data analysis and spatial programming techniques (bubble diagrams and functional adjacency mapping), interior design students articulated spatial problems.
3. **Ideate** – AI tools such as ChatGPT and Gemini were introduced to assist in generating spatial concepts, while Canva and Photopea supported visual exploration. In this stage, each student was asked to come up with mood boards and raw design sketches to develop in AI.
4. **Prototype** – Students selected AI-generated visuals to develop further through manual sketching and technical drawing. Interior design students conduct technical solutions in technical drawings, while fashion design students develop their designs to suit the interior settings provided by the interior design students.
5. **Test** – Concepts were reviewed through peer critique and instructor feedback within a small group in the studio. To assess the effects of AI usage in the design process, questionnaire data were gathered and assessed quantitatively through Likert-scale feedback post-workshop surveys and observations conducted in the studio. The questionnaire was distributed through the group leader to all studio participants. However, only approximately 80% of them returned the questionnaire (equivalent to 54 participants). Follow-up questions were carried out randomly in each small group in a casual focus group discussion manner, along with the weekly assignment work. By the end of the semester, both classes joined the end-of-semester design exhibition to receive critique and feedback from the general audience. The study's experimental design provided the freedom to use various tools while ensuring that every student adhered to the identical design thinking process.

## RESULTS AND DISCUSSION

### *1. Student Feedback and Reflections*

The whole event was divided into two major phases, namely before the mid-term exam and after the mid-term exam. The first phase was dedicated to empowering students with an understanding of their place in the design process, the introduction of design thinking methods, and how they can incorporate AI into the whole design process. There were two workshops to empower the design students, namely: the programming workshop (specific to interior design and architecture) and the AI workshop (open for design context in general). The output of this first phase is interior design programming, agreed common ground for design in interior and fashion development, and AI-developed interior design

in relevance to the case study given.



Picture I. Interior Design First Half Outcome  
Source : Linnata Putri Gunawan

Evaluation data were collected from students who participated in two integrated workshops: (1) programming and spatial analysis, and (2) AI-assisted ideation. Quantitative results using a 5-point Likert scale showed high levels of satisfaction in both workshops. The result is as follows :

**Table 1.1 Student Feedback Over The Workshops**

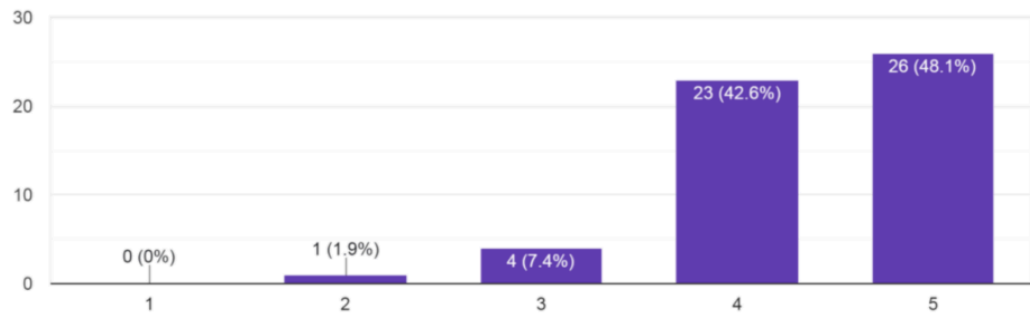
Indicator	Programming Workshop	AI Workshop
The material was presented clearly	4.64	4.61
The workshop was relevant to my design process	4.54	4.61
Activities helped me understand the concept	4.36	4.50
I feel confident using this	4.46	4.29
method after the workshop		
This approach	N/A	4.71

Indicator	Programming Workshop	AI Workshop
The material was presented clearly	4.64	4.61
supports design thinking, not replaces it		

Source : Processed by the Authors (2025)

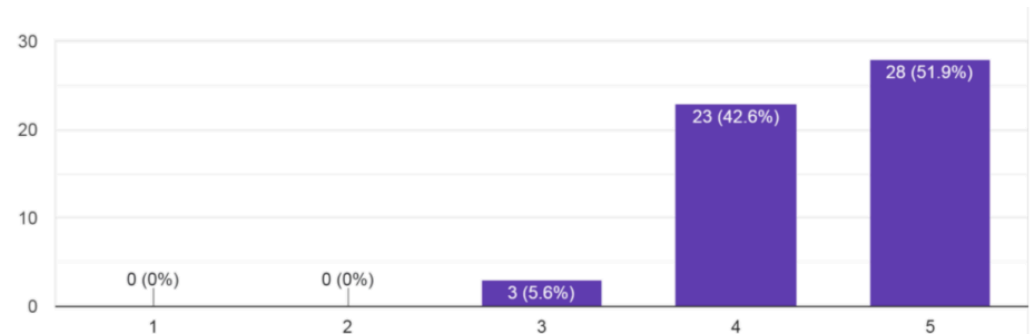
Most of the participants (90.7%) found that the material was presented clearly for the programming workshop, and this knowledge will be beneficial for them. Furthermore, the majority agreed that the workshop was particularly valuable for :

- Map space requirements based on data analysis.



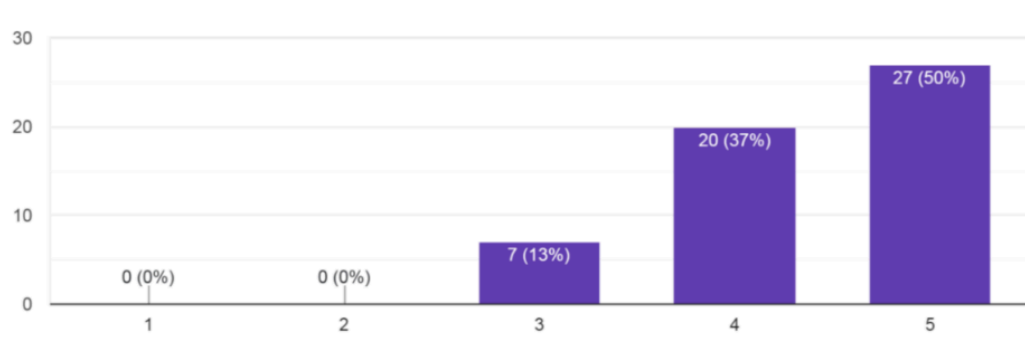
Source : Processed by the Authors (2025)

- Enable them to identify problems on the site more systematically.



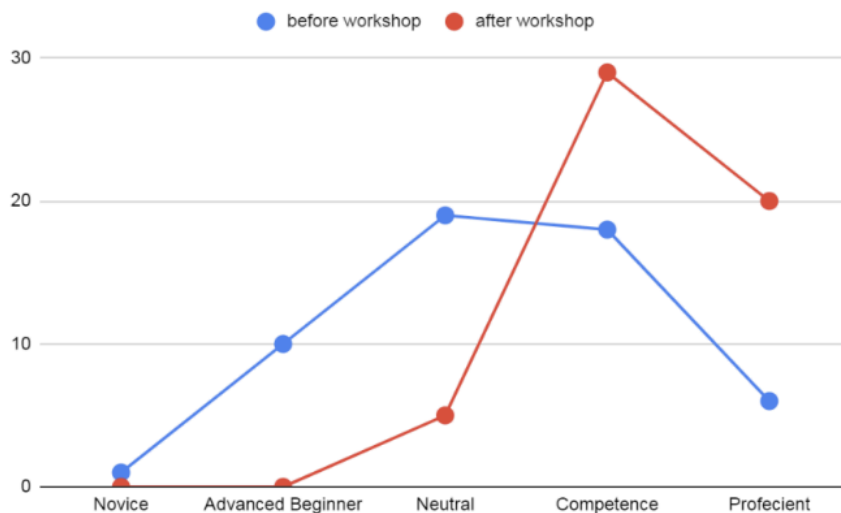
Source : Processed by the Authors (2025)

- Provide zoning and grouping recommendations based on collected data.



Source : Processed by the Authors (2025)

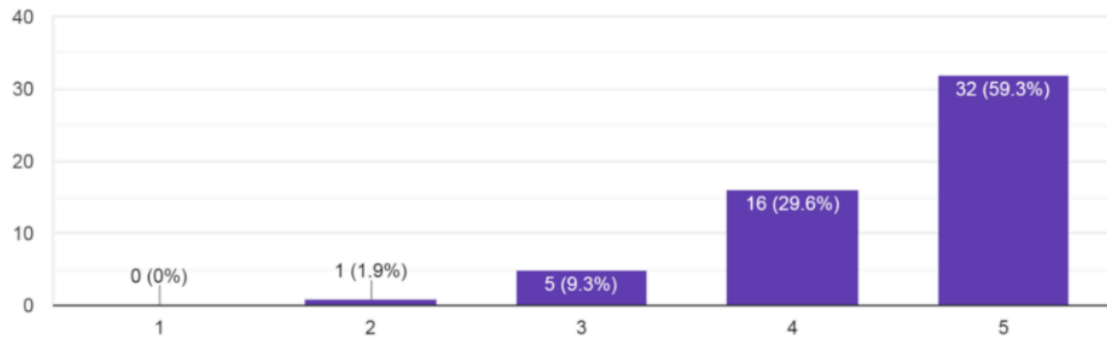
In line with the programming workshop, the AI workshop also yielded positive results. Most of the participants (94.5%) reported that the workshop was useful in supporting. Interestingly, although generally students are prone to AI use in daily information gathering, they lack the exercise of AI usage in design and generative image production. There was a significant rise in their perceived skill before and after the workshop. The following graph shows the increase in the number of participants who felt their ability to use AI increased after the workshop.



Source : Processed by the Authors (2025)

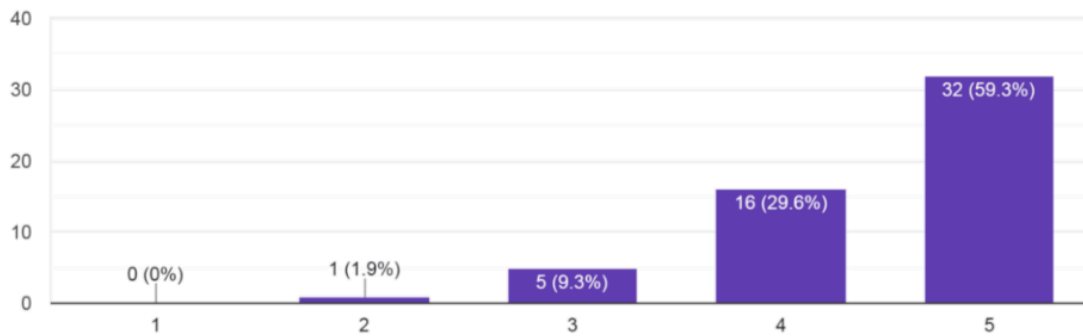
The majority agreed that the workshop was particularly valuable for :

- Develop design concepts more creatively.



Source : processed by the authors (2025)

- Be able to evaluate AI results and determine relevant elements for manual design.



Source : processed by the authors (2025)

In-depth follow-up questions conducted during the focus group discussions revealed that students appreciated how AI tools helped them to clarify abstract ideas and overcome early creative blocks. Several students noted that AI prompted unexpected design directions that they would not have considered otherwise. However, many struggled with composing effective prompts, interpreting AI-generated imagery, and aligning outputs with spatial constraints.

Some student responses included:

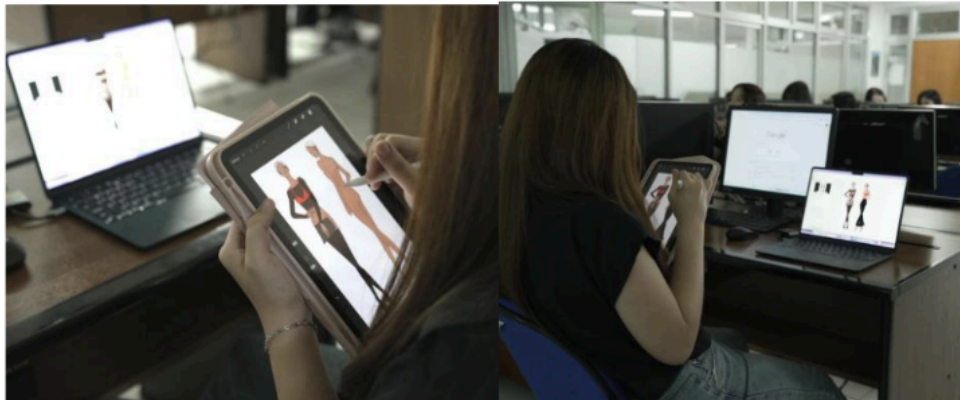
*“I used to be confused about where to start; the AI gave me something to react to.” (Informant 1)*

*“Sometimes the image looks cool, but doesn’t make sense for the space I designed.” (Informant 2)*

Although the overall feedback was positive, there remains room for improvement in the studio context. Suggestions for improvement included more guided practice on prompt writing, clearer explanations of AI limitations, and more time to explore the tools.

Students were given two weeks to examine the use of AI to improve their design before they present their design in the mid-term exam.

In the second phase, students from the interior design department focused on developing their final design in technical drawings. They were encouraged to break down their final design to understand the construction and details through layout, floor plan, ceiling plan, mechanical, electrical, elevations, and construction details. Meanwhile, the fashion design students transformed their sketches to fit the interior design provided by the interior designer students during the first phase. The fashion design students develop their digital sketches into realistic 3D drawings through an AI-assisted application called Look.ai.



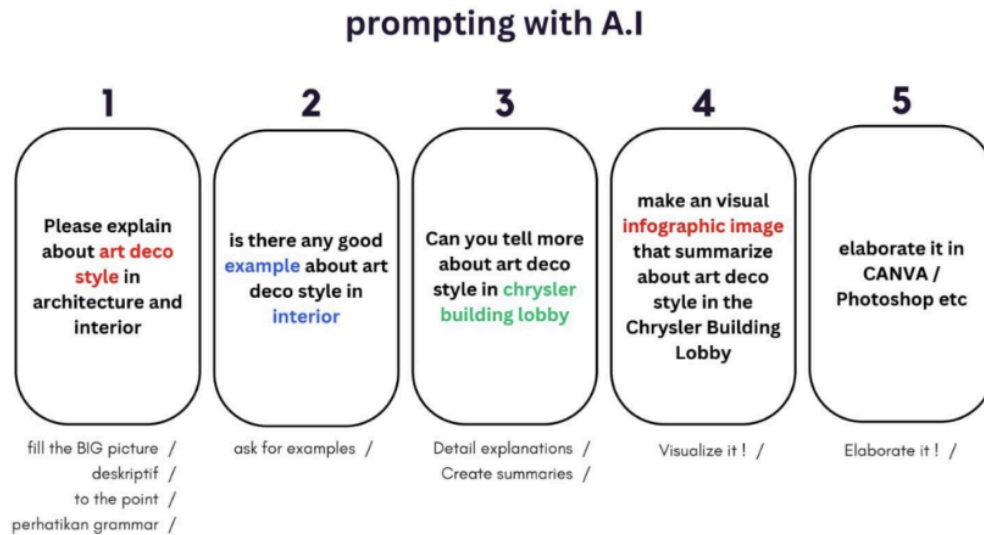
Picture 2. Fashion Development in the Second Half Phase

Source : Author

## ***2. Observations from Teaching Implementation***

From the viewpoint of the instructor, the incorporation of AI into early design education proved to be both challenging and beneficial. The first studio sessions (before the mid-term exam) were characterized by a struggle between established manual techniques and the introduction of AI tools. Although students displayed interest, many resorted to a hit-or-miss approach without comprehending how to effectively utilize AI.

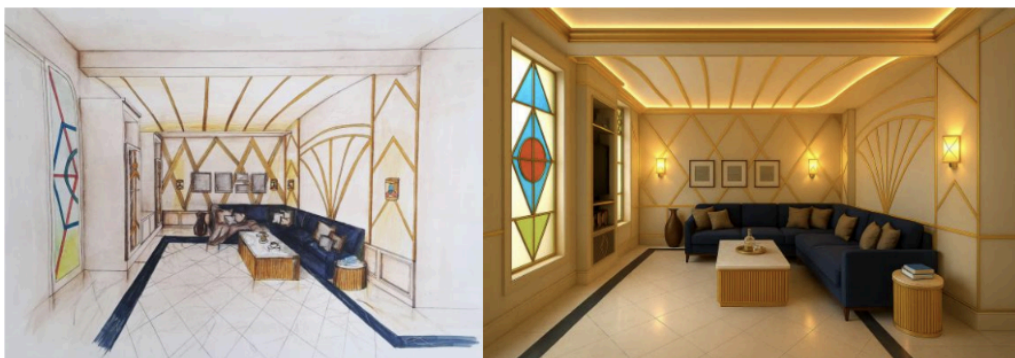
Students were divided into two different groups. Some students tended to over-reliance on AI-generated visuals as final solutions, without applying critical spatial judgment. They tend to quickly become discouraged because of the difficulty in formulating the correct narrative as a prompt to get the desired design. The situation was even challenging for fashion design students, who tend to achieve good visuals with a general prompt and get bad results when given a detailed prompt. Therefore, this formula works well for initial brainstorming (Erwin, 2025):



Picture 3. Brainstorming With AI: Steps in a General Design Context

Source : processed by the authors (2025)

One of the most important discoveries from this research was that the most effective design results occurred when students viewed AI-generated visuals as initial inspirations rather than final outputs. When students treated AI results as a foundation for further exploration, they showed increased critical engagement, curiosity, and spatial understanding. Rather than simply choosing and printing AI images, students were prompted to analyse how those visuals related to the realities of actual spaces, such as zoning, proportion, circulation, and user behaviour. Through manual sketching and iterative refinement, they converted speculative concepts into practical design solutions. Peer feedback sessions further enhanced this process by introducing students to various interpretations and promoting collective evaluation. This ongoing exchange between AI and manual techniques, balancing digital imagination with analogue accuracy, proved to be a highly effective teaching cycle that strengthened both creativity and technical proficiency.



Picture 4. Example of Final Interior Design

Source : Naomi Christella Tantokusumo



Picture 5. Example of Final Fashion Design  
Source : Elisa Revaldinha in context on Naomi's Design



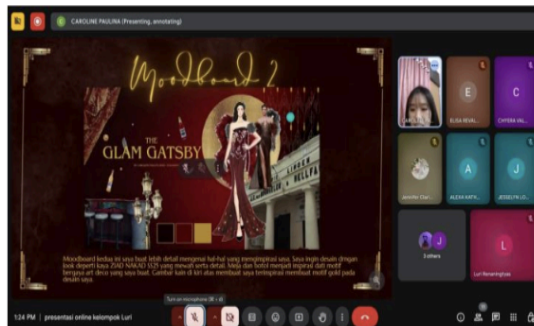
Picture 6. Example of Final Interior Design  
Source : Jennifer Wibowo



Picture 7. Example of Final Fashion Design  
Source: Caroline Paulina Budi in context on Jennifer's Design

Furthermore, collaboration with fashion design students played a crucial role in expanding the ideation process beyond mere visual appeal. By partnering with colleagues from a different design discipline, interior design students gained insights into alternative

interpretations of space through storytelling, movement, and experimentation with materials. The incorporation of Art Deco architectural influences provided a common historical foundation that students could reinterpret in both spatial and wearable contexts. This collaboration not only enhanced conceptual storytelling but also fostered empathy by helping students understand how various users might interact with design in diverse ways. The group format encouraged students to embrace more open-ended inquiries. Not just “how will this space appear?” but also “what narrative does it convey, and for whom?”. As a result, students started to recognize design as a form of communication rather than merely a visual endeavour, reflecting broader changes in design education towards narrative-focused and user-centred methodologies. This process was later recapped in online narrative presentations and exhibited offline through various possible media (e.g. design board, presentation maquette, postcard) in the end-of-semester exhibition.



Picture 8. Online Presentation Session

Source : Author



Picture 9. Offline Exhibition

Source : Author

### 3. Key Challenges and Opportunities

The experimental implementation of AI-assisted design pedagogy in an early-semester interior design studio surfaced several essential patterns:

- It became clear that prompt literacy was underdeveloped among second-semester students. Although students displayed eagerness to experiment with AI tools such as ChatGPT and image generators, many could not compose precise descriptive prompts. This often led to vague outputs with limited design relevance, particularly when students defaulted to aesthetic keywords without considering function, zoning, or user experience.
- Many students exhibited limited awareness of ethical considerations related to authorship and originality when using AI-generated content. In several cases, students treated AI-produced imagery as wholly their own work, omitting critical reflection on attribution, ownership, or the role of the machine in the creative process. The assumption of full authorship, despite the hybrid nature of the work, suggests a need for deeper instruction on ethical frameworks surrounding AI use in design education. In this research, authorship may not be questioned due to the nature of the encouragement of AI usage in these studios. A disclaimer should be noted in advance for future practices in other studios, and an understanding of the limitations AI may ethically use should be sounded over and over.
- Frequent misalignment between AI-generated visuals and real-world spatial feasibility. While students found inspiration in the stylistic and atmospheric qualities of AI outputs, they struggled to translate those visuals into spatially functional plans. Issues such as inaccurate scale, improper zoning, and unrealistic adjacency emerged when students attempted to convert 2D AI images into tangible spatial configurations. These mismatches often became visible during manual sketching, prompting revisions or complete reinterpretation. Yet this fact is aligned with the fashion studio as well, using AI to generate the final design from the initial stage sketches were most of the time inaccurately translated. Students got to do it back and forth, refining the prompt and moving across several AI tools simultaneously to get the desired result on the details; the beadings, the fringe, the pattern cutting, etc. AI rendered the feel that echoes Art Deco's design characteristics just enough but not for real production. Conversely, the embedded fashion figure within the interior concept anchored the storytelling of Art Deco design.

The integration also uncovered possibilities for enhancing creativity and idea generation. Students who approached AI as a tool for speculation, instead of a means to provide solutions, were able to explore unexpected design paths. These "what-if" scenarios broadened the students' conceptual horizons, allowing them to think more playfully and abstractly about spatial storytelling, especially in relation to Art Deco influences. The AI functioned as a creative catalyst, similar to mood boards or visual inspirations found in conventional design methods.

A key discovery was that providing structured support and interpretive context significantly enhanced the effectiveness of AI implementation. When teachers encouraged

reflective dialogue or critical evaluation, students were more inclined to recognize the shortcomings in their AI-generated results and improve them as needed. Additionally, feedback from peers helped shift attention to user requirements, functionality, and spatial reasoning, essential abilities that are frequently eclipsed by the aesthetic allure of AI-produced visuals.

Ultimately, it was noted that students who integrated AI tools with traditional design techniques, such as hand sketching, zoning diagrams, and conceptual mapping, achieved more coherent and spatially grounded results. With proper guidance, these students learned to view AI not as a replacement for critical thinking, but as a partner in the design process. This combined approach indicates that AI can effectively aid the ideation phase, as long as it is incorporated into a comprehensive pedagogical framework that strengthens essential interior design skills.

## DISCUSSION

The incorporation of AI into the foundational stages of design education highlights a conflict between the promise of technology and the responsibility of pedagogical guidance. Although students eagerly engaged with AI-generated materials, these interactions demonstrated that without proper guidance, there is a danger of shallow involvement, viewing AI as a mere shortcut instead of a collaborator in the creative process. This is consistent with earlier research in the field of AI and innovative education, which warns that technology can exacerbate existing disparities in design understanding if implemented without a framework for meaningful interpretation.

In this research, AI served most effectively not as a final design instrument, but as a catalyst for ideation. Students who utilized outputs generated by AI as starting points for discussion, refinement, and manual iterations created designs that were more thoughtful and spatially coherent. This reinforces the idea of AI as a provocative tool, aligning with human

centred teaching models where tools are designed to enhance intuition and critical judgment rather than replace them.

The design thinking-based experimental approach demonstrated effectiveness. It offered a well-defined framework for students to move from empathizing with users to visualizing abstract concepts. Nonetheless, a significant challenge lay in the students' ability to craft effective prompts, which had a direct impact on the quality of AI outputs. In future applications, incorporating prompt-writing as an essential skill in visual communication or design studio courses could improve engagement with AI.

Another pedagogical insight is the value of cross-disciplinary collaboration. The partnership with fashion design students not only expanded students' narrative thinking but also created opportunities to explore cultural, historical, and aesthetic dimensions beyond form making. This opens new opportunities for rethinking studio structures as transdisciplinary learning environments, particularly in Southeast Asian contexts where

local identity and global technologies intersect.

To sum up, these are the implications and recommendations for integrating AI into the design studio process:

- **Pedagogical Scaffolding:** AI integration must be accompanied by structured learning objectives, especially in early design education. Prompt-building, ethical use, and image interpretation should be explicitly taught.
- **Human-AI Co-Creation:** Design instructors should frame AI not as a shortcut but as part of a co-creation process that demands human judgment, empathy, and authorship.
- **Cross-Disciplinary Opportunities:** Collaborative projects across design disciplines (e.g., interior and fashion) open new pathways for narrative design exploration and contextual thinking.

These results correspond with the educational conflicts noted in recent literature regarding AI and creativity. For example, Floridi & Chiriatti (2020) discuss the uncertainties related to the knowledge that AI-generated materials bring, especially in terms of authorship and originality. The findings from this research support these worries in an educational environment, indicating that although AI can stimulate creativity and cross-disciplinary thinking, its effectiveness in education relies on proper direction, ethical considerations, and consistency with fundamental design principles.

## CONCLUSION

This research explored the experimental incorporation of AI into the education of early stage interior and fashion designers through a design thinking framework. The results indicate that AI, when framed as a collaborator in the brainstorming process instead of a definitive design solution, can assist novice designers in expressing their concepts and overcoming creative blocks. Nonetheless, effective integration necessitates more than just introducing tools—it relies on pedagogical structures, teaching frameworks, and instructional support that correspond with the cognitive growth of beginner designers.

The dual-workshop approach, one focused on manual programming and analysis, and the other on AI-augmented ideation, proved to be highly complementary. The hands-on activities enabled students to grasp spatial relationships, while AI brought a dimension of imaginative thinking that students could assess, modify, or disregard. Feedback from reflections indicated that students valued the rapidity and creativity provided by AI, but they also acknowledged its shortcomings and the ongoing importance of sketching and physical modelling. This was particularly evident among fashion design students, whose design ideas could not be accurately visualized without strong foundational sketch inputs.

Instead of presenting AI as a danger to essential skills, this research indicates that its careful integration can rekindle interest in hands-on techniques by providing students

with tangible elements to analyse, improve, or critique. These results are consistent with the educational challenges discussed in current literature regarding AI and creativity. For example, Floridi & Chiriatti (2020) point out the epistemological ambiguity brought about by AI

generated content, especially in terms of authorship and originality. Human supervision during design ideation processes is still required. The findings of this study support these issues within a classroom context, suggesting that while AI has the potential to boost creativity and interdisciplinary thought, its educational effectiveness relies on clear instructions, ethical considerations, and alignment with fundamental design principles.

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