[REPORT]

GENERATIVE AI IN DESIGN EDUCATION

KATE GECK
SCHOOL OF ARCHITECTURE & URBAN DESIGN

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COLLEGE OF DESIGN & SOCIAL CONTEXT

RMIT UNIVERSITY

2024

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For more, please visit
https://www.genaitoolkit.info/

ACKNOWLEDGEMENT OF COUNTRY

This project was completed on the unceded lands of the Wurundjeri People of the Eastern Kulin nation, we wish to acknowledge them as the Traditional owners.

The territory of the Wurundjeri lies within the inner city of Melbourne and extends north of the Great Dividing Ranges, east to Mt Baw Baw, south to Mordialloc Creek and west to the Werribee River.

The development of Melbourne heavily impacted the Wurundjeri People. Dispossession of land, dislocation, frontier clashes and introduced diseases led to a dramatic decline in the population.

Despite the effects of colonisation, the Indigenous people and culture survived and the strong bonds between families and clans could not be broken.

We pay our respects and acknowledge their Elders - past, present and emerging.

CONTRIBUTORS

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Design and Research Assistance
Kate Thaus

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[01] INTRODUCTION

OVERVIEW

Generative AI tools present critical challenges to design practice and design teaching. They produce compelling content with great speed and relative ease, processing "data to create entirely new text, audio, and images based on previous patterns of use" (Beckingham et al, 2024). These technologies, like the printing press and desktop computing before, will have a profound effect on creative industries. Design educators and students must develop literacy with these tools, and understand how to locate them professionally, or risk being left behind.

The aim of this design-led research project is to explore, document and analyse how generative machine learning models or "genAI" platforms like Firefly, MidJourney, and Chat GPT can be woven critically into design education to support collaboration, ideation and design development. The insights presented in this project have emerged from investigations in the design classroom alongside engagement with educators who use genAI in tertiary design teaching. This has led to the development of a genAI toolkit with a set of recommendations and activities that other educators may use in their own teaching practice.

CONTEXT

With the emergence of DALL-E in 2021 followed by Stable Diffusion, MidJourney, and Chat GPT in 2022, genAI promises to revolutionize many creative fields. However, little research has been conducted on the use of genAI tools within design education, despite it having an increasing effect on every stage of the design process, and radically shifting how designers ideate, develop, refine, and deliver outcomes (Chang et. al 2023, Fleischman 2024). Future-proofing Australian design industries requires that educators explore and test ways of contextualising these tools for students in practical and design-oriented ways. Yet these machine learning tools are moving so rapidly that pedagogical integration of genAI is happening in an ad-hoc and scattered way. While novel uses are co-emerging with demand, there's a notable absence of pedagogical guidance for design educators to adopt and implement genAI tools. There is a need to develop literature around how genAI can be integrated responsibly to educate the next generation of designers (Han et. al 2023). Art and design educators need to embrace genAI so they can prepare students for a rapidly changing future (Fahtoni 2023). An interdisciplinary approach is needed, gathering insights from a range of practitioners to understand this new space (Hutson and Plate 2024). In this project, we have sought to collect insights and best practices from our own design teaching practice alongside those from a range of design educators to offer strategies for adopting genAI tools in the classroom.

APPROACH

To contribute to literature on teaching with genAI, we have engaged three lines of inquiry:

01 ***Surveys with students enrolled in two tertiary design courses, to explore their experience with genAI.***

02 ***Reflections on our own teaching practice delivering genAI focused tertiary design courses, presented as two case studies.***

03 ***A collection of insights from two workshops held with art and design educators who teach with genAI at RMIT University.***

We will present and discuss our findings from these inquiries. This is followed by a set of PDF resources containing activities and scenarios that could be used in tertiary design education with genAI.

Photo credit
Kate Thaus, Gen AI Workshop. (2024)

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FINDINGS

This section collects the findings from the Surveys, presents the two teaching case studies and provides a series of insights from the educator workshops.

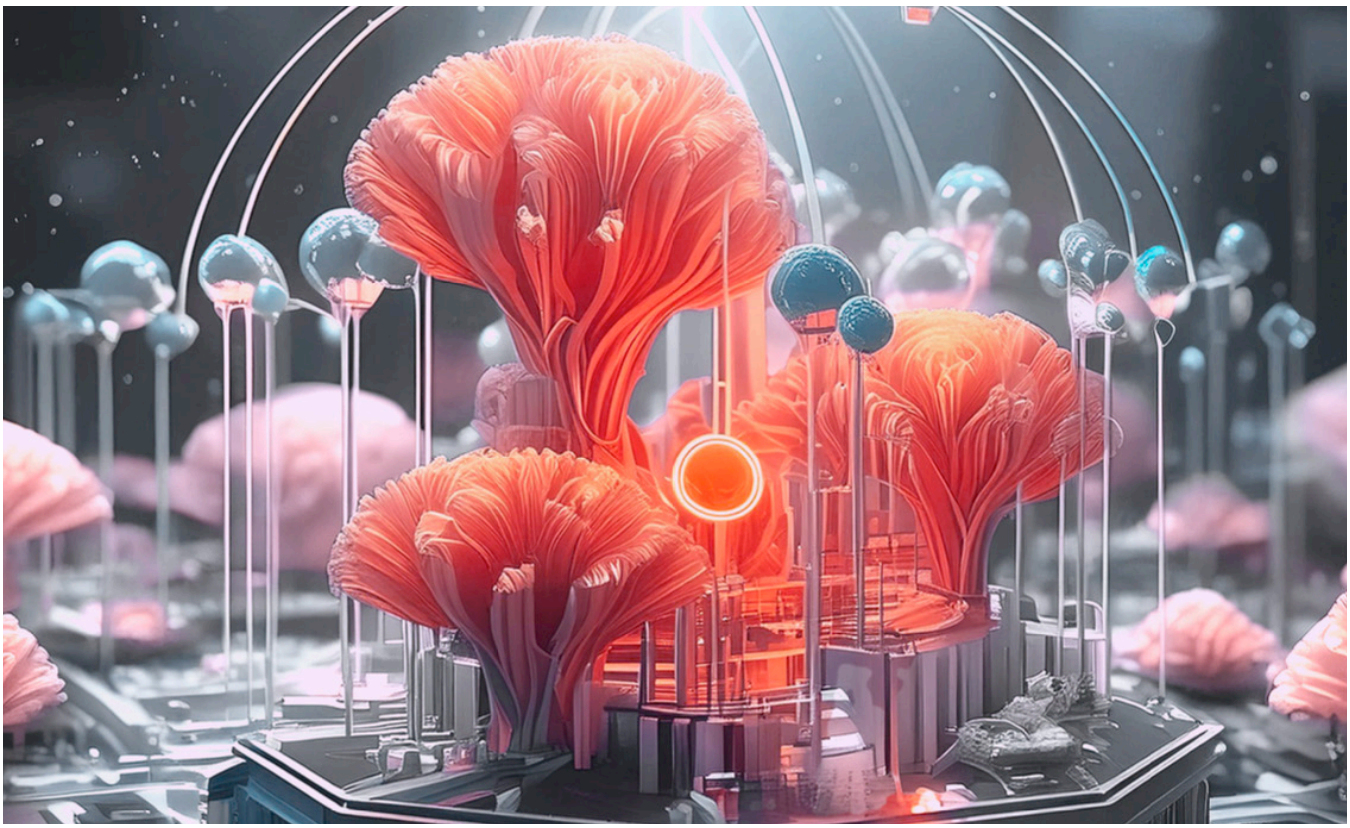


Photo credit
Above: Jisu Lee, Harishita Prakash, Paulina Restrepo 'Coral Resilience: Envisioning a Multispecies Future' (2024)
Below: Andy Yang, 'EcoSync Habitats' A speculative agency exploring the shared sensory spaces of humans + Arctic Terns to design nomadic, migratory housing. (2024)

STUDENT SURVEYS

We undertook a survey of the 32 students we taught across 2 courses in semester 1 2024. 16 students were part of a Masters level Design course, and 16 students were part of an Undergraduate level design course. The students were asked the following:

Please rate how strongly you agree or disagree with these statements:

> *I am familiar with AI-based design tools.*

> *I feel confident to utilise AI tools for design projects.*

> *I feel that AI tools have positively impacted on my design work and practice.*

> *I feel that AI tools have not made much difference to my design work and practice.*

> *AI tools offer unique advantages in comparison to conventional design software.*

> *There are unique ethical considerations in regard to the use by designers of AI tools for creative practice.*

> *I believe that incorporating AI tools is essential for future designers.*

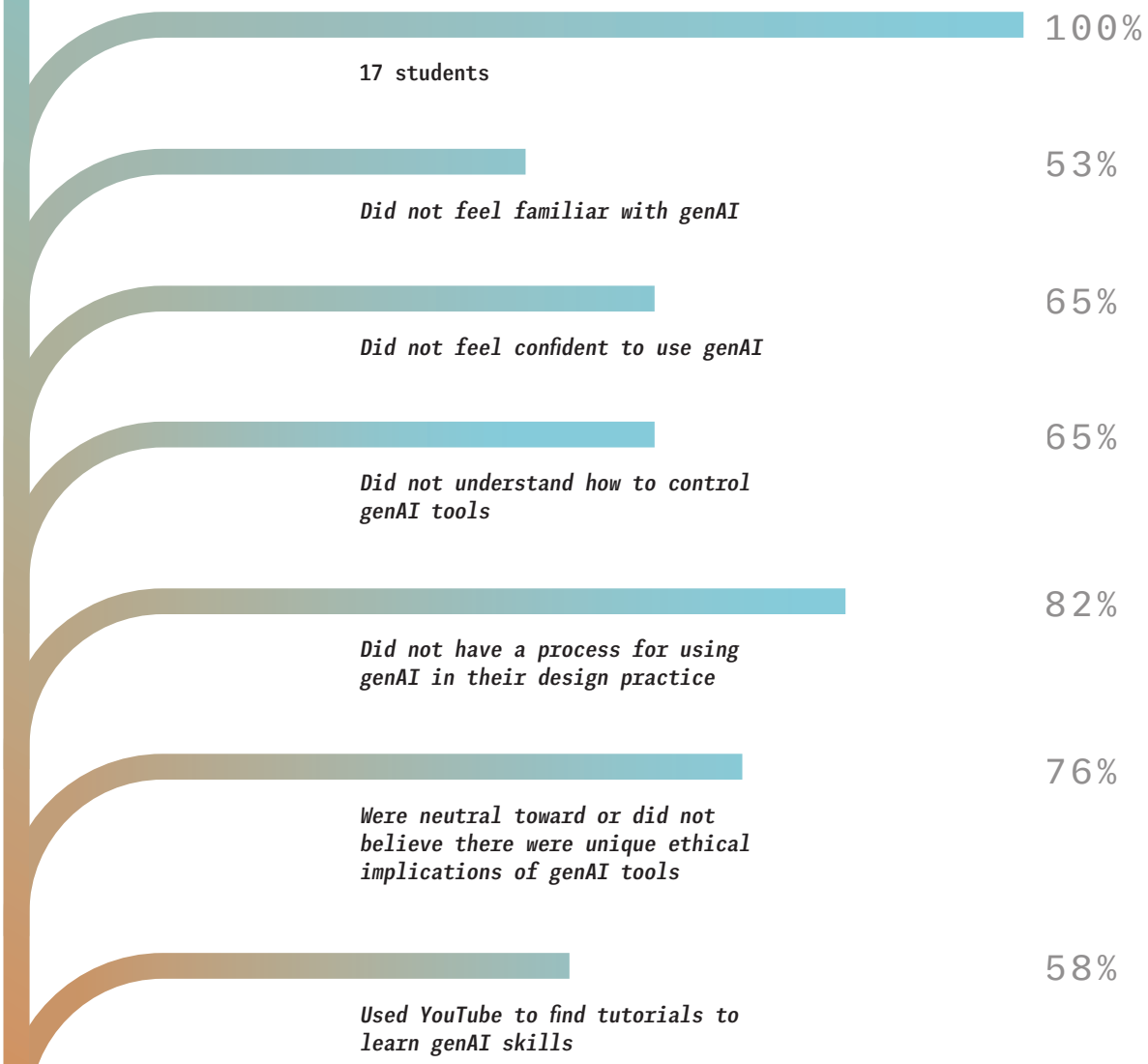
> *I understand how to control AI tools and refine the outputs.*

> *I have developed a process for using AI tools in my practice.*

Optional Short Answers:

\+ *List any AI tools you currently use in your design practice. Are there any barriers to you using AI tools at present - such as financial or technical?*

17 students responded, and we found that most of these students:



This confirmed for us that students were not confident in using the tools and faced frustration in understanding how to control them. It also indicated that most learning comes from YouTube where typically there is not a critical or academic context presented.

TEACHING CASE STUDIES

This section details our reflections on teaching genAI focused design courses during Semester 1 2024. We start each case study by explaining the aims and methods of the class and present the assessment structure. We then reflect on the outcomes of our teaching and identify stategies for meeting challenges.

CASE STUDY 01: ALGOMATERIALITIES INTERIOR DESIGN SPECIALISATION KATE GECK

Photo credit
Andy Yang, 'EcoSync Habitats' A speculative agency exploring the shared sensory spaces of humans + Arctic Terns to design nomadic, migratory housing. (2024)

Photo credit
Jacky Zhu and Yudi Huang, "Evolve It" A speculative agency using ad-hoc materials to produce survival + remediation wearables for a hostile planet. (2024)

STRUCTURE

This class was aimed at 3rd year students in the RMIT Bachelor of Interior Design. We explored genAI by speculating on the kinds of futures we might come to share with intelligent technologies. AI and ML were considered from a variety of critical perspectives by drawing on speculative and discursive design. Creative practice was used to think critically about emerging 'algomaterialities', which bring together human and more than human in speculative ecologies. Through image making and design thinking, students had to visualise the kinds of interior contexts that these algomaterialities will diffuse through. There was an emphasis on discussion, design iteration using prompt-based machine learning models, and the development of critical criteria for generating and refining images. Students worked weekly in small groups or pairs. The final assignment was paired. The class ran for 3 hours a week for 12 weeks, and involved slides, small group work and excursions to ACMI to see Memo Akten's work 'Distributed Consciousness' and the NGV Triennial to see the Heterobota by Agnieszka Pilat. These two artworks unfolded critical discourse around the myths and materialities of artificial intelligence and fed into the speculative futures context of the class.

PLATFORMS

We began with weekly generative tasks that used free Adobe accounts and ChatGPT, as students had a university subscription to Adobe Firefly and the genAI tools within Photoshop and Illustrator. These were chosen so that students could develop fundamental prompting and process techniques at no cost, to then potentially apply to paid platforms later in the semester. It was also emphasised that Adobe is an industry standard platform which they may encounter in the workplace, and that Firefly has been trained on "Adobe Stock images, openly licensed content, and public domain content" meaning that "Firefly is designed to be safe for commercial use." (Adobe, 2024) It was explained that students could choose to work exclusively with the free platforms, and that the choice of platform would not affect their ability to complete the assessment. However, students were informed before joining the class that they may wish to spend $50-$100 on genAI subscriptions over the semester to things like MidJourney and Runway. Group work was designed to help mitigate/share subscription costs. All of the students decided to move over into MidJourney by the middle of the semester, finding Firefly a little limited. In early 2024, MidJourney had superior image generating capacities and produced much more evocative and cinematic imagery. However, all students began to bring these images into Photoshop and experiment with its genAI capabilities to extend the edges of their MidJourney image, edit and add elements in, and add figures. Update August 2024: I have found that students using the newer Firefly version 3 are producing much more evocative images than the version 2 described in this case study.

ASSESSMENT

The class was split into 3 parts. Each part had a conceptual and practical focus, and was evaluated through an assessment task.

PART 01
GENERATIVE AI

Week 01 - 04

Classwork focused on generative AI precedents and introductory practices with Firefly, Chat GPT, Photoshop and Illustrator.

- > Conceptual Aims: Unpack assumptions + knowledge about genAI
- > Practical Aims: Introduce tools + techniques
- > Assignment 1: Tests 20% Due Week 4
- > Present a folio of your image-making over the last 4 weeks.
- > Refine homework tasks based on your evolving skills.
- > Include prompts/settings.
- > Provide evocative descriptions of the images.
- > Produce a brief reflection on how you are working with the tools.

Photo credit
Jacky Zhu and Yudi Huang, "Evolve It" A speculative agency using ad-hoc materials to produce survival + remediation wearables for a hostile planet. (2024)

PART 02
DESIGN FUTURES

Week 05 - 08

Classwork introduced a range of Design Future card decks to help students expand futures thinking. MidJourney was introduced.

- Conceptual Aims: More-than-human design + Speculative Design
- Practical Aims: Futuring techniques + MidJourney
- Assignment 2: Design for a more than human 30%
- Research a more than human and produce a suite of 4 speculative designs that attend to its sensory world and provide opportunities for multispecies flourishing. Produce a diagram of that creature's sensory world intersecting with your own. Present as a 5 minute verbal presentation. Include process work and prompts/settings. Provide a short reflection on the values and challenges of multispecies design.

PART 03
PROPOSITIONAL PRACTICES

Week 09 - 12

Classwork focused on groupwork and idea refinement. The idea that collaborative work with emerging tools was needed to design for an expanded world of needs was emphasised.

- Practical Aims: Work in pairs to develop an agency + series of designs.
- Conceptual Aims: Produce a 4 point manifesto on your values + vision.
- Assignment 3: Speculative Design Agency 50%
- You have your own speculative design agency. Research a more than human and produce a suite of 6 speculative designs that attend to its sensory world and provide opportunities for multispecies flourishing.Generate a logo and manifesto to communicate your values and vision. Present as a 10 minute verbal presentation. Include process work and prompts/settings. Provide a short reflection on role in the team and learning over the project.

REFLECTION

The first week revealed that students had less understanding of the field than anticipated. A scoping activity showed that while students are aware of AI and generative AI, they lacked a critical understanding of its applications, the extent of its current use and its cultural implications. Visiting Memo Akten's work generated many questions around how it was created and unfolded questions around non-human intelligences. As per the student survey, students had little experience with genAI tools. The students were enthusiastic at the beginning, but this enthusiasm waned between the 1st and 2nd assignments when students needed to develop their own processes of iteration and refinement. They communicated that this was often frustrating. There was a strong desire to produce super high-fidelity images. As a result, I found I had to work to reframe the generative AI as a 'conversation' between student + tool, as well as a 'conversation starter' for self, clients and collaborators. It was emphasised that they were making propositional images to unfold thinking about the future. Reframing how and why they could use genAI as a tool of suggestion was something of a breakthrough. Moving the image making out of the space of 'resolution' or 'render' and into the space of 'proposition' or 'concept' meant students became more relaxed about weirdness in the images and opened up to the unexpected ideas and paths that often appeared. Students were encouraged to edit and refine images using Photoshop and began to see genAI as part of a process and as a tool for ideation.

The first assignment mistakenly lacked focus on experimentation. Future assignments were then clearly divided into process documentation, final image presentation, and thematic reflections. The 2nd and 3rd assignments included process documentation, and this really helped me to locate how students were using the tools for themselves as part of an independent process. For example, some would generate an image in MidJourney, then expand and edit the image in Photoshop. Others would collage generated images in Photoshop, and/or add figures to help describe them. The relationship between text and image was a critical site to analyse, and this would often demonstrate how independently students were using the tools both in terms of concept development and technical skill.

Photo credit
Andy Yang, 'EcoSync Habitats' A speculative agency exploring the shared sensory spaces of humans + Arctic Terns to design nomadic, migratory housing. (2024)

Weekly tasks focused on case studies that acted as creative prompts. These were followed by tutorials on generative tools to create images exploring the speculative, more than human themes of the class. Weekly homework was designed to feed into each assessment task, which in turn were designed to guide the student through 12 weeks of critical thinking about the future using genAI to start conversations. The speculative, more- than-human themes of the class were useful for unfolding discursive space about the ethical implications of genAI, the extension of human cognition though technology, and the blurriness of the boundaries between humans, technologies and the living world.

By the end of the semester, students were open to much more speculative ways of thinking and working. I felt that they had successfully started to use genAI as a tool for unfolding conversation and for encouraging ideation, rather than a tool for rendering fixed 'final' works. Throughout, genAI was conceptualised as a relationship where student and model had to work in conversation. GenAI itself was also conceptualised as an assemblage of human imagination, built on databases of many diverse creative artefacts. This helped to foster a sense of openness and sharing in the classroom, with Miro used to share not only images but also prompts and settings. These technical parameters were emphasised to be part and parcel of the image - to promote transparency and to help develop awareness around prompting language and the use of styles, camera settings and framing. Throughout, students were encouraged to collect examples of images, prompts and settings. Iteration was often framed through modifications to tool parameters, model versions, aspect ratio, design styles, film directors, camera settings and degree of scale. This helped communicate the intrinsic relation of language to image in genAI image making. The anonymous end of semester Course Evaluation results indicated that the students found the course helpful and that they felt supported to use the tools.

SUMMARY

Challenges:

- *Everything was new*
- *High levels of anxiety*
- *Frustration around lack of AI control*
- *Tendency to anthropomorphise both AI and more than humans*
- *Literacy - some images were stylised in confusing or contradictory ways*

Strategies:

- *Emphasise that tools change, need to develop metaskills + critique.*
- *Reassurance, generosity, examples and scaffolding.*
- *Framing the relation between AI + designer as collaborative + generative.*
- *Emphasise unknowing + uncertainty as generative spaces.*
- *Emphasising a decentering of the human in design - in terms of the speculative MTH content and also with genAI as a tool.*
- *Emphasise they are working in to the future of design: designing for a shared world and designing with emerging technologies.*
- *Emphasise the intrinsic relationship between text and image in genAI.*

Photo credit
Calvin Xie, 'EcoSync Habitats' A speculative agency exploring the shared sensory spaces of humans + Arctic Terns to design nomadic, migratory housing. (2024)

CASE STUDY 02:
DESIGNING WITH DATA
DR EMMA LUKE

Photo credit
Harishita Prakash, Jisu Lee, Pulina Restrepo.‘White Sea, Coral Bleaching’. (2024)

STRUCTURE

DWD is an elective class available to Master's student in the RMIT MDIT program (Masters of Design Innovation and Technology).

This class focused on data's expanding currency as an indispensable vehicle for collection, monitoring and analysis across a myriad of industries. Initial research activities explored the intricacies of Big Data precedents, patterns in vast interconnected datasets, the navigation of Open Data for public reporting and governmental transparency, and monitoring of personal activities and health metrics through personal informatics.

Emphasis was placed on Data literacy, ethics and storytelling as keys to unravelling and decoding complex webs of information. From the origins of information encoding to emerging discourse in generative AI and immersive technology the course was a dynamic exploration of data and how we can design with it.

Students explored the symbiotic relationship between design processes and data to craft both informative and creatively engaging outcomes. A substantial focus was placed on navigating ethical considerations in data gathering, analysis, and representation.

DWD was a three-hour class that ran for 12 weeks. The first four weeks of the subject focused on an introduction to designing with data, research on data-driven design precedents and the development of an individual data narrative based on a week's worth of data collected by the students on a personal data set of their choosing. As the students moved into synthesizing and visualising their collected data sets, genAI Design tools were introduced to assist them in analysing, collating and ideating engaging ways to physicalize their data sets. Following on from the individual project, students worked in groups of 3 for the remainder of the semester to realise a data driven physical data object or interactive installation. The team's challenge was to research and document the plight of an endangered animal or plant in a particular eco-system through data, using GEN AI tools to speculate on how multispecies and technological collaborations could envisage future adaptations and transformations that would ensure more-than-human flourishing.

The MDIT cohort is a mix of both cognate and non-cognate design students, hailing from a diverse range of background such as UX/UI, Industrial design, graphic design, business, mechanical and software engineering. This group had a general awareness of AI tools but little practical experience and were generally uneasy about the prospect of working with the tools creatively to fulfill the assignments in class.

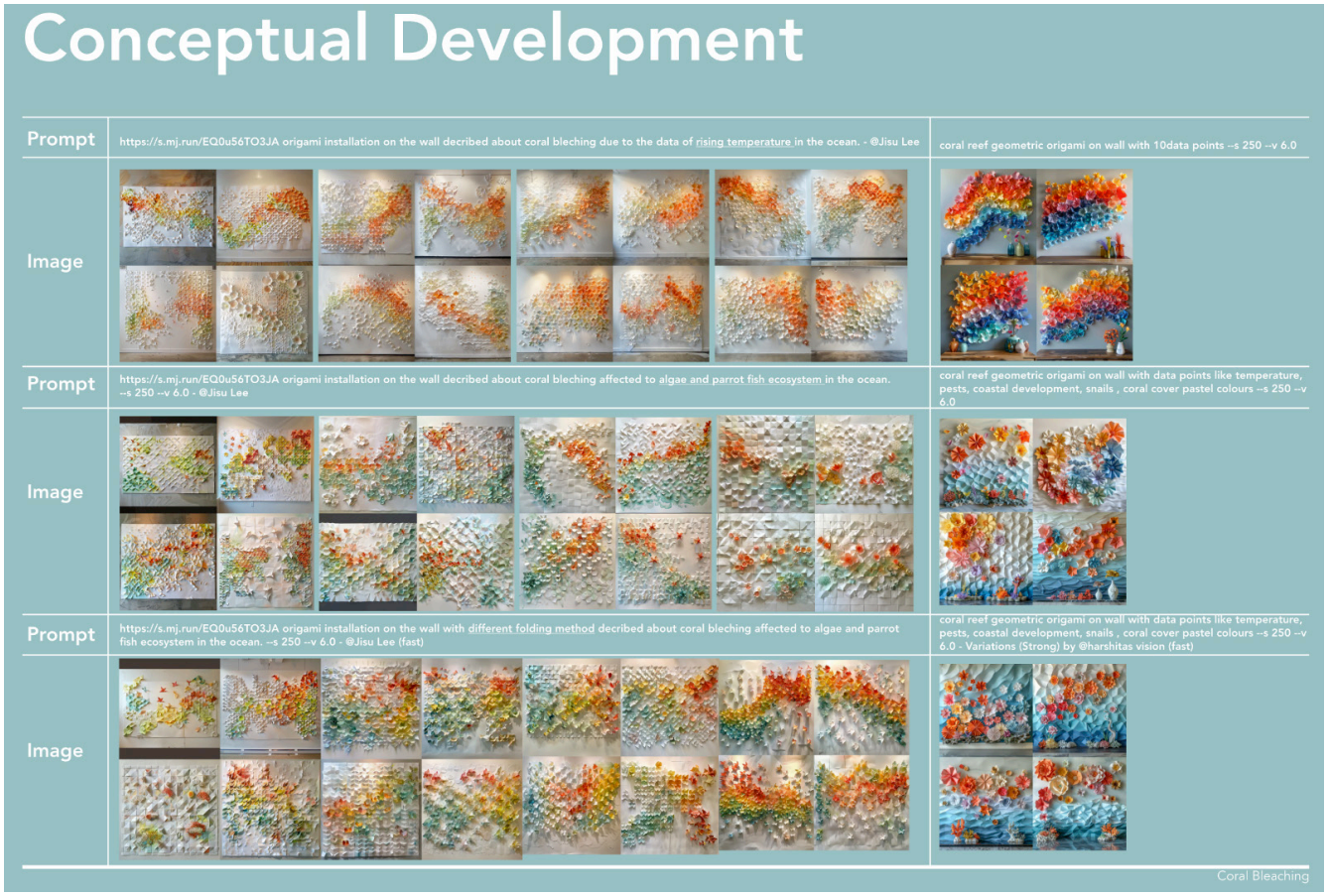


Photo credit
Harishita Prakash 'White Sea, Coral Blaching'. (2024)

In the initial research and development activity students were required to immerse themselves in the world of data-driven design researching and critiquing a range of key precedents and producing a data-driven object of their own. As a primer activity in week 3 students were introduced to an exercise on generating design metaphors with GenAI tools. ChatGPT and Midjourney (or Adobe Firefly, DALL-E) were used to assist them in developing a design metaphor reference for the physicalisation of their data that would encapsulate a core message about their project narrative.

Design metaphors are powerful conceptual tools that make use of the symbolic and familiar to frame problems and communicate messages. From relational to appearance led metaphors this can be a challenging concept for design students to initially grasp and incorporate in their work.

In this first activity we looked at how ChatGpt and Midjourney could be used in the development of a design metaphor that could form the basis of the physicalisation of the student's personal data narrative. For the in-class example ChatGPT was employed to come up with 10 concepts for the physicalisation of 50 sleep data points.

Photo credit
*Above:*Nina Maskiell 'Pre-Colonial Plants Generative Ecologies' (2024).

01
DATA IMMERSION

Week 01 - 04

Classwork involved initial research into designing with data, tools methods and key precedents. This coincided with an introduction to working with ChatGPT and Midjourney to explore the interpretation of datasets and produce a personal data-driven design object. Final data objects were to be physical prototypes made using low-cost craft/ found objects. The chosen form / materials or interactivity demonstrating a design metaphor for a theme or observed behaviour in the data set.

ASSESSMENT

Conceptual Aims:

> Create and present a data-driven project aligned to a self-directed research topic.

> Iteratively develop ideas & designs informed by data.

Practical Aims:

> Research and evaluate data-driven projects from a range of international precedents.

> Collect, analyse and visualise a data set.

> Implement digital technologies (genAI tools) to conceptualise options for your project outcome.

> Create a data physicalisation.

Submission:

> 5 minute presentation / demonstration of data physicalisation.

> 12 page research and process document.

Photo credit

Above Joshua Wait, Nina Maskiell, Shivangi Mahajan 'Pre-Colonial Plants Generative Ecologies' (2024).

Below: Joshua Wait 'Project Tape, visualising food miles'(2024).

02
DATA NARRATIVE WORK

Week 04 - 09

The next part of the semester involved students working in groups of 3, to research a core ecological theme and develop a concept for a data driven design project in which Generative AI tools were utilized to imagine ways to visualise and implement the urgent design interventions needed to foster care and enact change on our damaged planet.

Task:

01 To investigate an issue or story involving endangered animals or plants in a particular eco-system through the collection and analysis of data, and expression of findings represented in a situated physical data object or installation.

02 Building on the learnings and experiences of part 1 use GEN AI tools to speculate on how multispecies collaborations with nature, animals, and technological entities could envisage adaptations and transformations of the Earth that may ensure more-than-human flourishing.

Conceptual Aims:

> To conceptually explore the boundaries between artificial, human, and more-than-human intelligences through the lens of data driven design.

Practical Aims:

> Researching and cataloging a data set. Using ChatGPT, data vis tools and data journalism techniques to interpret the data and develop a critical view of the context.

> Utilize a digital workflow encompassing ChatGPT and Midjourney (or Adobe Firefly, DALL- E) to develop a series of concepts for ways to represent the data in a final physical data object or installation.

Submission:

> In-class group concept presentation (Pecha Kucha model) with 20 slides at 20seconds each.

> 20-page group research document - Include process work and prompts/ settings.

03
DATA NARRATIVE FINAL WORK

Week 09 - 12

Building on the previous work presented in the week 9, classwork was focused on refinement of the project narrative, conceptual development and plans for physically making and assembling / displaying the final data objects.

Task:

> Working in groups of 3, students built on and resolved the work developed in assignment 2A -to produce a final exhibition ready and fully resolved- physical data object or interactive installation.

Conceptual Aims:

> Uncovering relationships in the data, creating and conceptualising counter-narratives through the use of genAI and data vis tools.

> Employ genAI as a design tool and catalyst for co-creation. Acting as a design futurist interrogate various ways AI technologies could be harnessed for design intervention. Speculate on how a partnership with technology could change the data narrative for your chosen species or ecology for the better.

Practical Aims:

> Work as a team to articulate a complex data narrative.

> Critical and reflective analysis of data and research materials.

> Develop an understanding of the principles of designing with data, refining and resolving ideas through appropriate choice of tools and mediums.

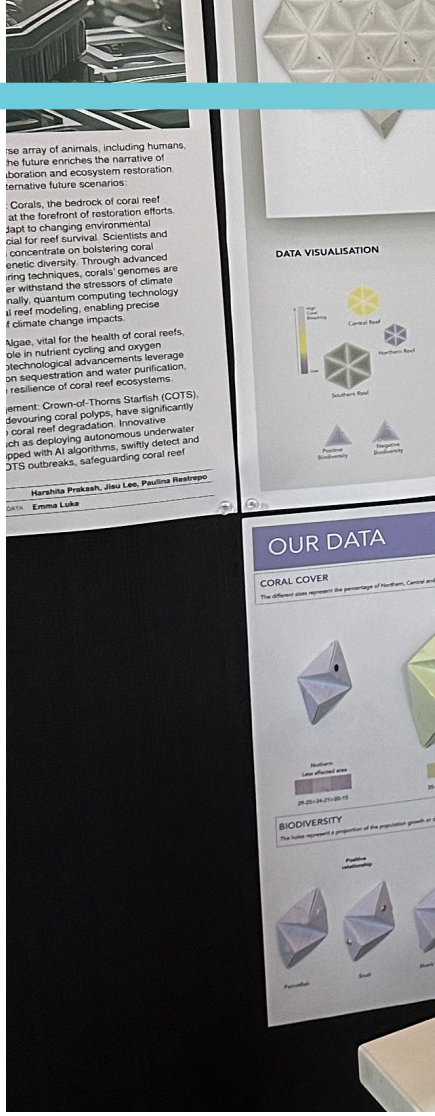
> Communication of the designing with data final project outcome through professionally executed installation, process documentation and exhibition materials.

Submission:

> Final presentation.

> Exhibition / demonstation of final data physicalisation.

> Project documentation comprisedof a landscape pdf, providing process work, refinement and a short reflection on roles in the team and learnings over the course of semester.

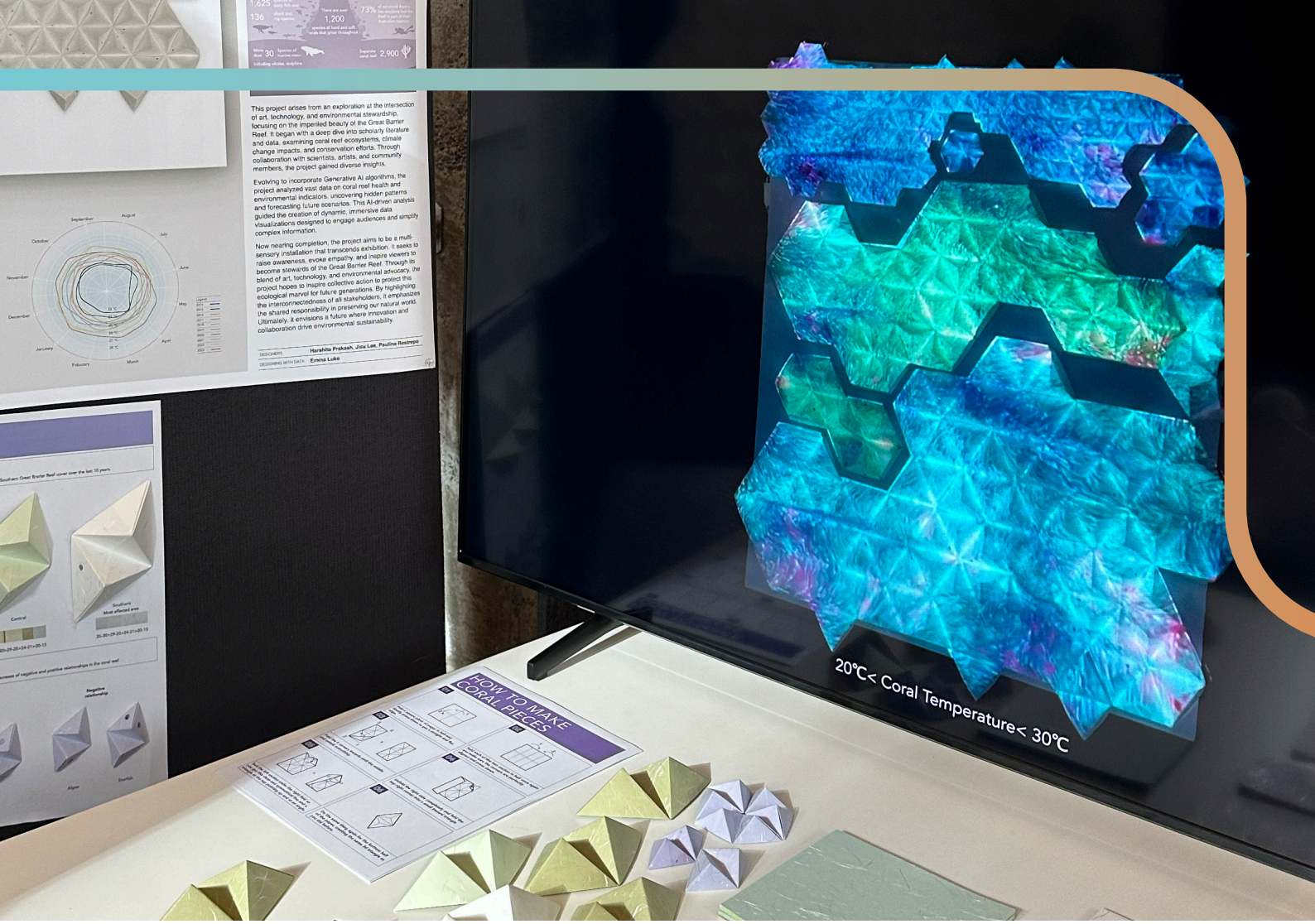


REFLECTION

Conceptual design activities can often lead to a lot of anxiety in design students as they shift from desk research, to being asked to design and produce something tangible. This is especially evident in a program like MDIT where for some students coming from non-creative backgrounds this may be their first design experience ever. What I found from the introduction of genAI tools in this course was that it brought the students a lot of relief and a lighter more 'playful' approach to early ideation stages which can often be angst ridden. Students are often highly reliant on educators in the early stages of a design project as they seek constant reassurance for their initial ideas. The genAI tools used provided students with a sounding board and the ability to quickly express and extend their ideas in cases where they might not yet have the design skill to easily iterate and explore multiple options. Students often suffer from first idea paralysis and struggle to come up with a range of options for how they might tackle a brief or respond to a problem. What the genAI workflow did was help students to go wide in ideation early and quickly giving them more scope to critically evaluate a larger pool of ideas and focus on what would be the most compelling and appropriate response to the brief not the difficulty of expressing ideas. Whilst the students still had the challenge in Designing with Data of physically crafting their data physicalisations, they were given more options and ways to think through how they might do this by bouncing ideas off the genAI platforms. In the final group data physicalisation assignment the students used tools such as ChatGPT to both decipher data and guide them through methods for analysing it with other data vis platforms. More advanced students extended the range of their projects by using data sets to train a custom ChatGPT providing more advanced readings of the data and nuanced responses for their design project.

As the students moved into the making phase of their final group data physicalisations it was interesting to note the way the use of genAI tools changed from a role of generation to support. Whilst the students looked to Midjourney for aesthetic inspiration as to how they might realise aspects of the final

Photo credit
Harishita Prakash, Jisu Lee, Paulina Restrepo 'White Sea Coral Bleaching'(2024)



installation, ChatGPT shifted into the support role of studio assistant. ChatGPT continued to be consulted about materials, fabrication and assemble techniques as the student's problem solved making their physical installations with 3d printing, laser cutting, casting, origami and creative coding techniques.

Data driven design project are by nature complex, with digital data vis tools and creative coding platforms a large learning curve within themselves to master. Let alone using multiple platforms to build and quickly decipher a data set then realise this physically in a matter of weeks. The transdisciplinary knowledge crossover the genAI tools provided enhanced the learning experience for the students. Design research is a process that involves exploring precedents, theory, tools, materials and techniques and applying them in response to a design brief. In the past the specificity of design challenges has often meant that there is little support for novice creatives to translate and connect ideas, with specialised design and process knowledge quickly. In the case of Designing with Data the genAI tools allowed a lower and faster barrier to entry in the design experimentation and making process, scaffolding together multiple knowledges and data sets to give students a support tool that facilitated creative problem solving in a niche context.

SUMMARY

Challenges:

> *Fear of unknown territory and getting started with text prompts.*

> *A concern that genAI was in some way related to generative design programs such as Grasshopper which can be challenging and take a long time to learn.*

> *Translation anxiety to move from a mesmerizing AI polished concept image to making a less impressive physical real-world object.*

> *Becoming overwhelmed by the sheer number of options causing decision fatigue.*

Strategies:

> *Lower the bar to entry, start with easy, accessible and playful activities.*

> *Emphasis on iteration and 'playing in the shallows' go shallow and wide early.*

> *Treat tools like materials, optimize them by being transient and moving back and forth between platforms.*

> *Keep a designerly lens and emphasize critical and reflective approaches that forefront ethical practice and an awareness of bias.*

> *Encourage students to focus on a central path of enquiry and not get lost in 'time suck' AI rabbit holes.*

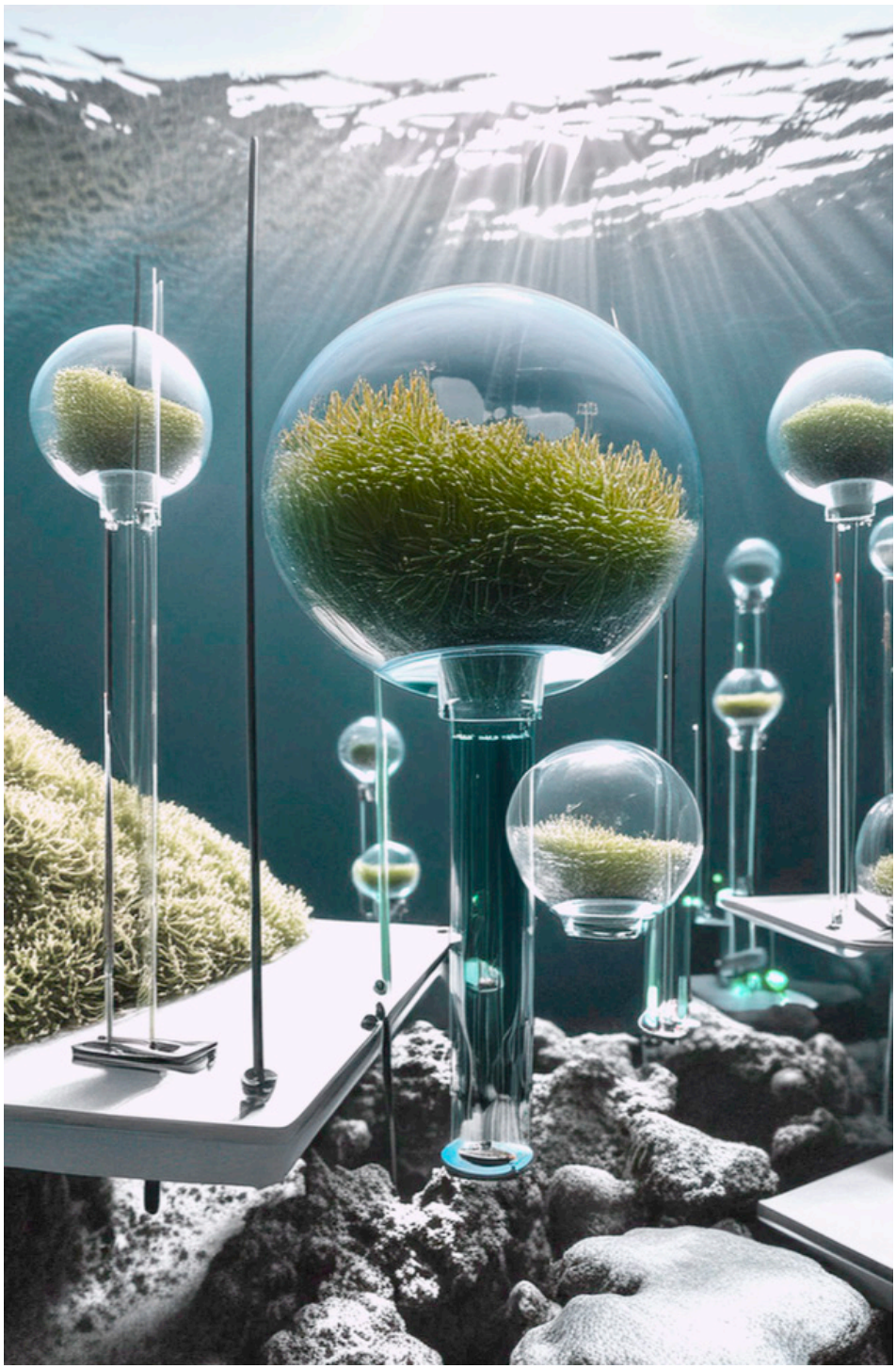


Photo credit
Harishita Prakash ‘Algae Vitalitu: Envisioning a Multispecies Future’. (2024)

INSIGHTS FROM WORKSHOPS WITH DESIGN EDUCATORS

This section has been generated collaboratively between the following RMIT educators: Dr. Emma Luke, Kate Geck, Dr. Tom Penney, Kirsten Black, Ian Haig, Dr. Alan Nguyen, Martine Corompt, Jess Sansum, Dr. Daniel Binns, Ying-Lan Dann, Dr. Olivia Hamilton, Thom Luke, Dr. John Power, Kate Thaus.

Two workshops were held in May 2024 with 12 design academics from RMIT University. Participants were found through an open call to educators who were working with genAI in their teaching practice within the College of Design and Social Context.

The participants were:

Dr. Emma Luke	*Industrial Design*
Kate Geck	*Interior Design*
Dr. Tom Penney	*Games Design*
Kirsten Black	*Learning + Teaching*
Ian Haig	*Art*
Dr. Alan Nguyen	*Media and Communication*
Martine Corompt	*Art*
Jess Sansum	*Art*
Dr. Daniel Binns	*Media and Communication*
Ying-Lan Dann	*Interior Design*
Dr. Olivia Hamilton	*Interior Design*
Thom Luke	*Industrial Design*
Dr. John Power	*Digital Design*
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The educators represented a diverse range of practices across art and design, with the majority reflecting on work with undergraduate students. All teachers had been using genAI tools in their classes over the preceding 12 months within a creative context. The workshops ran for 2 hours and featured 2 design prompts to generate discussion. Educators were placed in pairs to discuss questions, before a general conversation was recorded and synthesised for this report. The following insights have emerged from these conversations with these teaching staff.

Photo credit
Kate Thaus, Gen AI Workshop. (2024)

WORKSHOP PART 01:
THE LANDSCAPE

OVERVIEW

Part 01 asked educators to reflect on student expectations around genAI, addressing myths, preconceptions, and challenges. The two key insights generated from these discussions were 'literacy' and 'process'. Students needed support to develop image literacy, often struggling to understand the contexts from which prompt language had emerged - such as filmic constructs, camera settings, and histories of art/design style. In terms of process, students often needed support to locate genAI tools as a new part of an already known design process that must involve iteration, reflection and refinement. Educators agreed that developing skills with these technologies would be a requirement for becoming 'future ready'. Students need to be prepared to be reflexive 'forever learners' to navigate the rapidly evolving landscape of creative practices influenced by AI. Staff agreed it would be of value to develop shared repositories of resources, and advocated for accessible AI platforms to enhance digital and design literacy among students. Below is a synthesis of the conversations from the two workshops.

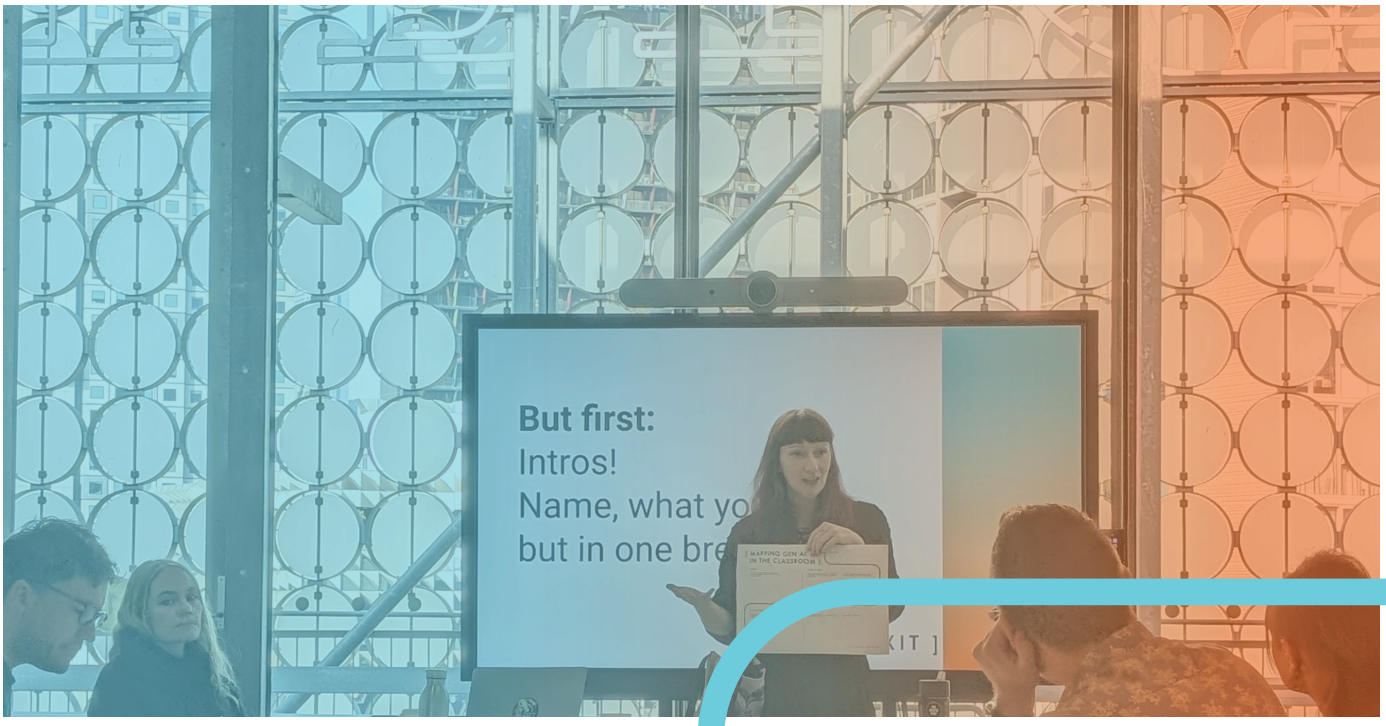

Photo credit
Kate Thaus, Gen AI Workshop. (2024)

MYTHS & FEARS

> Discussions revealed diverse views of AI among students ranging from utopian to dystopian. This highlighted that it is crucial to balance these views with critical literature and Indigenous perspectives to promote collaboration and responsibility. However, it was noted that perhaps this critical lens should be introduced later to avoid students being overwhelmed at the outset, and to promote openness and exploration with the tools in the first instance.

> There is some fear among students that AI will replace traditional artistic practices and lead to job loss, or even render some creative careers obsolete. Concerns include issues of authenticity, origins of information, intellectual property theft, biases in AI-generated content, loss of true design skills and the potential for deep fakes. This showed that it is important to contextualise these tools within art, design and technology histories: disruptions have and will occur, and it becomes a critical skill to understand how you will work within continually emerging landscapes. It emphasised the need to support students to evaluate sources of information, to develop their own ethical stance and to use these to form their own opinions on emerging technologies.

> Generative AI, which creates text and images, should be distinguished from Artificial General Intelligence (AGI), which involves broader cognitive abilities akin to human intelligence. It is important to understand genAI can be seen to emerge in part from a historical tradition of generative art and computer science. These distinctions again help to contextualise the current genAI tools within art and design histories.

> There was a lot of misinformation and uncertainty around social media and 'image scraping'. Often these fears seemed at odds with widespread image posting on social media and blogs. The level of influence of individual images within large databases like Laion-5B was also challenging to communicate. Again this highlighted the need to provide opportunities to develop critical thinking skills and evaluate sources of information.

EDUCATIONAL CHALLENGES

> Students across all design disciplines often struggled with translating AI-generated concepts into practical, real-world applications. There is often tension between the generated image and its potential to be resolved into an actual design. This highlights a need to emphasize the development of traditional art and design skills alongside any development of new skills with genAI.

> Students sometimes overestimate the simplicity of using AI tools, not fully appreciating the effort and refinement required to produce high-quality outputs. This highlights the need to present genAI as part of a cyclic process of iteration and refinement, rather than a singular, linear outcome.

> There are generational differences in digital literacy and critical thinking skills, impacting how students perceive and utilize AI. This highlighted the importance of including critical reflection on the way tools are used, as well as contextualising image aesthetics through art and design history.

> It was noted that different disciplines seemed to approach generative AI in nuanced ways. Authenticity seemed more of a concern in Art and Games Design whereas in Built Environment and Industrial Design there has historically been greater emphasis on the use of generative design processes such as parametric modeling. These students were potentially more receptive to an iterative approach and exploring how AI designs could be realized physically through 3D printing or machining methods.

ETHICAL CONSIDERATIONS

> Addressing biases in AI-generated content, particularly in body representation and cultural backgrounds, is essential. Educators stress the importance of fostering critical discussions around AI's impact on creative practices and ethical AI use.

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> As the legality of tool use in many circumstances is still unfolding and being determined, it is important to discuss potential long-term ramifications and use cases. Classes could develop user etiquette around what constitutes unauthorized use of content, despite the curiosity and temptations it may present. Students should be supported to understand the differences between copyright, limited rights, and creative commons images to help develop an ethical and authentic approach to tool usage. Using Adobe Firefly does help mitigate many of these issues.

> Understanding how generative AI models work from a technical perspective is also an important aspect of working ethically and critically with them. Students should understand the differences in the ways that models like GAN, LLM and Diffusion work.

Photo credit
Kate Thaus, Gen AI Workshop. (2024)

From these insights, staff then reflected on strategies and approaches to meet the above challenges:

GENERATION VS. RENDERING

> AI image making is always part of an unfolding process. Educators emphasised the relational aspect of this exchange, noting that there was often a shift in thinking needed from the students to understand that generated images would require editing and iteration. We found the 'StingRay Model' for AI very useful here, as it emphasizes this iterative, refining practice required between genAI platforms and students. Understanding generative AI as a 'visual conversation' was one metaphor described.

> Emphasise the exchange and relational aspect of making with genAI.

> Encourage students to push beyond first idea paralysis and utilize genAI's capacity to deliver a range of novel possibilities in the design ideation process.

A NEW TOOL FOR AN ENDURING PRACTICE

> Educators emphasise teaching students how to effectively integrate AI into their creative processes rather than replacing traditional skills.

> Integrating AI into creative projects can emphasise collaborative learning. It's crucial to prioritize human interaction and teamwork over individual reliance on AI tools, fostering a balanced approach.

> Educators advocate for continuing to teach critical iteration and emphasise design processes to empower students in controlling AI tools effectively. AI is a new tool that can become part of a traditional design practice that continues to be centered in iteration, material investigation and critical reflection.

BUILD IMAGE AND CONTEXTUAL LITERACY

> There is a need to balance teaching practical genAI skills with the delivery of historical and contextual art and design knowledge.

> It is important to understand the historical context for certain image styles as well as for technical prompts around lenses and styles of shots.

> AI represents the latest in a series of technological advancements that have historically influenced artistic practices.

> AI tools contribute to an abundance of art but can also homogenize styles based on their training data: students need to reflect on their outputs and develop their own criteria for evaluating images.

THINK LONG-TERM

> AI has the potential to fundamentally change how creative practices are approached and executed.

> Educators will continue to need to navigate fast-paced technological changes while maintaining relevance in teaching practices.

> It is crucial to adapt educational curricula to incorporate AI thoughtfully, preparing students for evolving professional practices in art and design.

> Students need to maintain meta skills of 'how to learn' so they can continue to meet new technologies as they emerge.

These insights highlight the complexities and opportunities in integrating AI into creative education, emphasizing the need for a balanced approach that combines technical skills with critical thinking and ethical considerations. The need to engage students with critical inquiry into the materialities of artificial intelligence was a consistent theme. The conversations emphasised that digital practices need to move away from the level of the individual and incorporate 'systemic thinking and broader implications'. (Klein, 2015 p30).

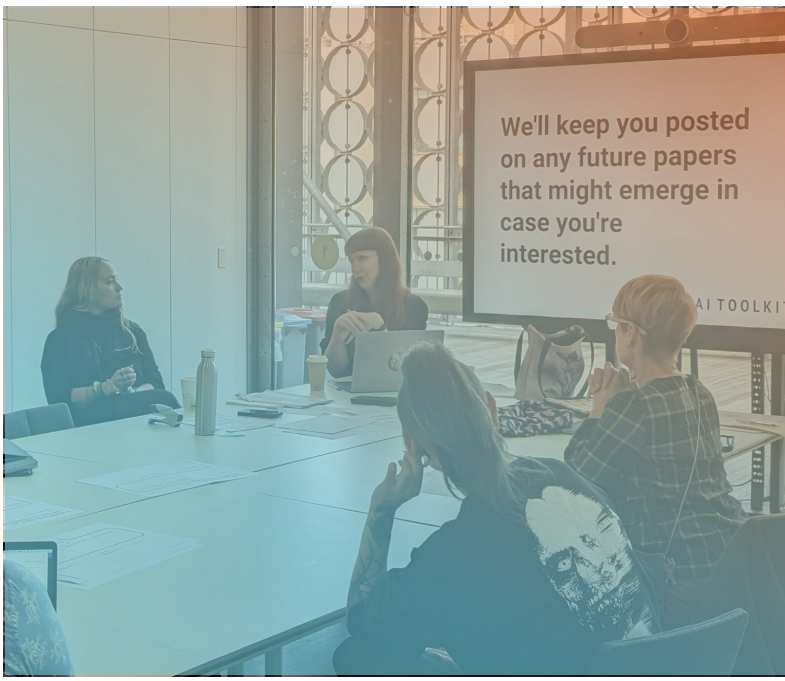
WORKSHOP PART 02: ACTIVITY AND PLATFORM IDEAS

Photo credit
Kate Thaus, Gen AI Workshop. (2024)

In part 2 of the workshop, educators worked in pairs to quickly propose a class activity to work with genAI that may address some of the concerns uncovered above.

These ideas have been collected in the Activities PDF (which is also available on the genaitoolkit.info website). There are dot point suggestions for activities across three areas of Tools, Discussion Starters, and Technical Skills. This is also a small selection of activity ideas that put these suggestions into practice.

[03] CONCLUSION



As this report demonstrates, there is a need to develop "pedagogical approaches that facilitate meaningful integration of AI tools in design education, necessitating a deeper exploration of effective teaching methodologies" (Chang et. al 2023). The three lines of inquiry explored through this report have revealed that students and educators alike recognise the significant opportunities and challenges that are emerging in art and design through genAI tools. It appears many students lack confidence in using these tools, and this is coupled with myth and misinformation about the nature of genAI. When beginning to use these tools, students face the usual challenges in learning new skills such as frustration, lack of control, and a gap between idea and outcome. However, this is perhaps complexified by the unique nature of genAI tools which produce high fidelity images that can be difficult to unpack into workable, actual design outcomes. Potentially, these high- resolution images can 'close' students off to engagement with typical design processes of iteration and refinement. For these reasons, it is crucial for educators to continue to emphasise the use and development of traditional design skills of ideation, iteration and refinement. The way that genAI is framed by educators can assist here: if it is introduced as a new tool for ideation, it can be understood as a step in the larger design process that must include iteration and reflection to refine. The case studies and workshop also greatly emphasised the need to continue to build students' critical literacy around image making. This means providing information on art and design histories and composition techniques, so that students can build literacy around ways to describe images in order to prompt the generation of new images. Chat GPT can be used as a way to support this connection between image and text. Essentially, we believe that continued emphasis on and support for traditional design literacies is a necessary component of working with genAI in design education, alongside the development of critical thinking skills.

Photo credit
Kate Thaus, Gen AI Workshop. (2024)

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GENERATIVE AI IN DESIGN EDUCATION

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2024

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