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INTRODUCTION

A Focus on Pedagogy Emerging Theories, Teaching & Technologies

Academia: the epitome of an 'ivory tower'. A bastion of siloed thinking. Distanced from the 'real world'. The criticisms of what we do as educators can be cutting. However, today, many identify that academia is 'turning outwards'. No longer beholden to established practices, it is increasingly diverse and varied. We see this in student focused learning. We see it in problem-based learning. We see it in the embracing of AI. We see it in the areas we are supported to research, and the partnerships we are encouraged to make.

From a pedagogical perspective, this outward turn is accompanied by our own developments, like the rejection of 'single size' teaching styles, projects 'relevant' to the modern student, and academic-industry partnerships connecting with the 'real world'. Inside the academy we are pioneering new technologies and experimenting with educational psychology. We are pushing the boundaries of what we understand teaching and learning to be. We are influencing the world outside. The result of all this, is a modern academy that is complex, nuanced and cutting edge.

Reflecting on this, the Focus on Pedagogy 2025 conference, Emerging Theories, Teaching & Technologies, explored a multitude of issues informing contemporary academia. As a result, the papers included in this volume deal with emerging approaches to teaching and learning. They examine the effects of the digital turn, critique evolving research agendas and fields and present case studies of individual classes. Seeking to instigate debate on connecting communities, professionals and students they examine how we can best support our students – through both the changing terrain of learning, and their life outside the academy. This particular issue focuses on the disciplines of art and design.

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THE POETICS OF DIFFERENCE

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INTRODUCTION

This paper examines the marginalized value of interior design education in relation to a pedagogy that inquires into interiority—intimate experience—towards authentic individuation.¹ Prevailing interior design education performs predominantly within industry-driven frameworks that prioritize reproducible competencies and measurable outcomes, significantly devaluing subjective creativity and cultural inquiry. This instrumentalization demands critical examination of what it means to educate interior designers in an era that values efficiency over authentic creative voice.

The pedagogy engages with concepts of difference and relation as fundamental concerns of interior design, focusing on unfolding the subjectivity of the individual as the poetics of the interior. Difference refers to the generative force that emerges from encountering otherness and multiplicity, while relation describes how identities and meanings form through ongoing engagement rather than existing as fixed essences. The studio is reimagined as a formless archive—a collective situation where valuable narratives, relations, and identities emerge. This conception challenges conventional educational structures that organize knowledge into discrete categories, embracing instead ambiguity, multiplicity, and emergence as fundamental values.

Through speculating on the concept of making, students develop embodied understanding that cannot be fully articulated through language or conveyed through demonstration. The pedagogy evolves across three years after the common foundation year within the Interior Design Studio at Virginia Commonwealth University: from observational site-specific installation to development of individual voice to synthetic thesis projects. It explores how interior design education could enhance awareness of the value of individual authenticity as the poetics of difference, continuously reflecting on informality, imperfection, and multiplicity as provocations to explore our evolving sense of interiority.

STUDIO AS COLLECTIVE SITUATION

This pedagogy inquires into the concept of collective situation and its contribution to students' journey of authentic individuation. The concept of authentic individuation emerges from traditions that understand selfhood not as a fixed essence but as an ongoing process of becoming.² Students are encouraged to reflect on their own creative processes, observing not only what they make but also how they make it, noticing patterns in their decision-making, recognizing their habitual responses to different kinds of challenges, and identifying moments when they feel most engaged or most resistant. The collective situation, a formless archive, is conceived as a space that embraces becoming, not rationalized and systematic but rather abstract and poetic. Unlike traditional archives that organize

materials according to established categories, the collective situation remains fluid and evolving, with materials forming temporary constellations that continuously dissolve and reconfigure. Students' self-reflective capacity develops gradually through sustained practice and requires establishing studio conditions that support introspection rather than constant external evaluation or comparison with others.

Embracing difference and relation to foster continuous self-reflection, the studio cultivates an openness that enables ongoing self-exploration. Difference here encompasses both differences between individuals and the multiplicity within each individual, including the various and sometimes contradictory impulses, interests, and capacities that constitute subjectivity.

Deleuze and Guattari's concept of smooth space provides a framework for this approach. They describe it as "a field without conduits or channels,"³ a heterogeneous environment that supports multiple forms of movement and relation. Unlike striated space, which organizes and regulates movement along predetermined paths, smooth space allows movement in any direction, responding to local conditions and immediate encounters.

The studio as a smooth space allows for nomadic rather than sedentary modes of learning, where students wander through various territories of exploration without being bound to any single methodology or outcome. Within this environment, the studio evolves by exploring the potentials of multiplicity stemming from the coexistence of difference and relation. This fluidity allows constant transformation as boundaries between self and other blur. This blurring does not dissolve into undifferentiated convergence but rather enables more complex relational dynamics where students maintain their singularity while simultaneously participating in collective processes that influence their individual development.

The collective situation becomes not merely a repository but an evolutionary space where speculative traces of risk-taking and collaborative discovery continue forming an affective space for subsequent creative journeys. The concept of collective situation draws on Glissant's poetics of relation, a relational phenomenon affected by difference. This framework helps us understand how cultural identity and creative expression emerge not from isolated essence but from ongoing encounter with difference. In this view, relation is not something added to already-constituted identities but the very process through which identity forms and transforms.

Glissant contrasts binary practice, which operates through exclusion, with poetics, which seeks "the space of difference"⁴ where difference is realized and extended beyond simple opposition. By embracing the fluidity of boundaries and the interconnectedness of self and other, the collective situation evolves as a poetic space, embracing diverse perspectives that deepen students' understanding of interiority. The studio as collective situation embodies this relational understanding, creating conditions where identity emerges through engagement rather than being brought to engagement as a predetermined given.

MAKING AS EMBODIED PRACTICE

Building on this understanding of individuation within collective situations, the pedagogy attends to how difference operates as a generative force through embodied making practices. Instead of dissolving difference into common understanding, the collective situation encourages students to view difference subjectively as a process of interiorization.⁵ Deleuze's concept of difference challenges conventional understanding as mere opposing forces, positioning it as generative force producing new possibilities: "Difference finds its own concept in the posited contradiction: it is here that it becomes pure, intrinsic, essential, qualitative, synthetic and productive."⁶

Engaging with difference as a generative force distinguishes interior design from purely technical or functional approaches. The interior becomes a site where subjective experience, cultural values,

material conditions, and spatial relationships converge in ways that cannot be fully rationalized or reduced to functional requirements. This view requires inhabiting the realm of the intermediary, learning to dwell in liminal zones where clear distinctions break down and stable categories become fluid.

As Sennett articulates, "An ecological border, like a cell membrane, resists indiscriminate mixture; it contains differences but is porous. The border is an active edge."⁷ This active edge serves as a border space that allows for the exchange of ideas and influences, creating an interactive community as the poetics of the interior. This mindset leads students to gain awareness of creative possibilities emerging at the intersection of differences, preventing the studio from settling into a static state through dynamic exchange between individual creative endeavors and collective studio culture.

Border thinking extends to phenomenological engagement with space itself. The poetics of the interior extends Bachelard's spatial phenomenology to portray the embodied, affective, and imaginative aspects of dwelling. Bachelard writes, "the house shelters daydreaming, the house protects the dreamer, the house allows one to dream in peace."⁸ The studio as a collective situation supports this phenomenological understanding by encouraging students to attend to their own experiential responses to materials and spatial conditions rather than immediately abstracting experience into concepts or representations.

Building on this phenomenological understanding, making in the collective situation implies the entire process of crafting a creative voice through embodied practice. As Heidegger explains, the cabinetmaker "makes himself answer and respond above all to the different kinds of wood and to the shapes slumbering within wood,"⁹ maintaining a relatedness to material that sustains the craft. The cabinetmaker does not simply execute predetermined forms but discovers possibilities inherent in particular pieces of wood, responding to grain, color, and texture in ways that reveal rather than obscure material nature.

The studio integrates process-driven apprenticeships to develop embodied understanding through sustained engagement with materials and making processes. To encounter inherent material qualities and relational possibilities within specific conditions, students engage in a process of interiorization that is both repetitive and speculative, allowing intuition to play an active role in every decision-making moment. This requires developing sensitivity to subtle differences that might escape casual observation.

Students practice introspective response to inherent material properties and spatial conditions, leading them to speculate about what Heidegger defines as dwelling rather than merely producing objects. As he states, "We attain to dwelling, so it seems, only by means of building. The latter, building, has the former, dwelling, as its goal. Still, not every building is a dwelling."¹⁰ This embodied understanding emerges through sustained, attentive engagement with materials and spatial conditions.

As this embodied practice develops, students experience the body's tendency to recede from conscious awareness in skilled practice, where conscious attention and embodied action merge.¹¹ Sennett describes this quality of skilled craftsmanship, noting that "The good craftsman avoids perfectionism that can degrade into a self-conscious demonstration."¹² Through making, students gain tangible evidence of their creative agency and discover capacities they may not have recognized. Making increases self-confidence in autonomous decision-making and in the appropriation of differences to reveal new relations. Through these practices, the connection between interior space and interiority becomes manifest as designed environments shape not only external forms but also internal sensibilities, revealing the inseparability of outer and inner experience.

STUDIO AS PLAYGROUND

The concept of studio as playground implies a significant transition from conventional settings emphasizing skill acquisition toward approaches that foster speculative creativity and genuine improvisation. This playground concept suggests that genuine creative development necessitates a protected environment for playful engagement that enables open-ended exploration. Given Rancière's observation that "Every institution is an explication in social act, a dramatization of inequality,"¹³ this pedagogical approach examines methods of incorporating play into interior design education.

This visionary perspective toward a playful educational setting challenges conventional approaches to assessment. Rather than applying standardized measurement instruments to evaluate innate creativity, this pedagogy recognizes that genuine creative development arises from individuals possessing an ecological mindset that encompasses differences and fosters an interactive community thriving on diversity and inclusivity.

As Deleuze and Guattari argue, "We are not talking then about a dualism between two kinds of things, but of a multiplicity of dimensions, lines, and directions within an arrangement."¹⁴ Multiplicity encompasses limitless possibilities for becoming. Within the studio context, embracing multiplicity fosters cultures encouraging curiosity, exploration, and invention. Play embodies these principles, encouraging students to engage with open-ended materials and environments that support multiple forms of creative exploration.

Aldo van Eyck's concept of ambivalence in playground designs significantly influences the idea of play. Withagen and Caljouw observe that van Eyck's play elements lack designated functions, allowing multiple uses depending on the game being played, and with their simple and abstract forms, these elements stimulate children to use their imagination.¹⁵ By blurring the purpose of elements, van Eyck allows children to explore undiscovered possibilities, fostering imagination. This approach not only supports imaginative play but also develops critical thinking as children continuously navigate the space and invent new ways to interact with the elements.

The playful dimension should not be mistaken for mere entertainment or frivolity but understood as serious engagement with possibility unconstrained by predetermined outcomes or instrumental demands. As Rancière notes, "Improvisation is the exercise by which the human being knows himself."¹⁶ Improvisation is integrated into making as the most authentic tool for individuation. As Deleuze and Guattari write, "Inexactitude is the exact path of what is done, and not at all an approximation."¹⁷

Students gain understanding of the importance of avoiding perfectionism and valuing inexactitude as a state of becoming. Even under the pressure of inevitable criticism regarding imperfection and uncertainty, the studio continuously evolves as an ambivalent space. Here, students cultivate the autonomous mindset that enhances their sense of ownership and inspires further exploration as active participants in shaping their own learning experiences.

PEDAGOGICAL APPROACH

The pedagogy is implemented across three years of undergraduate interior design education. The three-year pedagogical progression moves from emancipation through crafting narrativity to synthesis. Sophomores engage in observational practices through site-specific installations. Juniors develop individual voices through iterative processes. Seniors create thesis projects through authentic contextualization. This developmental sequence is grounded in the understanding that an authentic creative voice emerges gradually through sustained engagement. The following senior thesis project demonstrates the culmination of this studio experience, integrating individual exploration with embodied understanding and authentic communication.

The first step in senior thesis projects involves developing individual project manifestos. These manifestos express each student's evolving awareness of their creative concerns, cultural perspectives, and career goals. They articulate the pedagogy's emphasis on individuation through crafting own narrativity, functioning as frameworks for in-depth research while remaining flexible enough to evolve as the creative process progresses. Students develop their own methodological approaches, contextualizing their unique creative work within multicultural, historical, and interdisciplinary contexts.

One student's thesis demonstrates this pedagogical approach through a multi-level stairwell installation. This presentation format spatially manifests her senior thesis development, with each level revealing a distinct phase of her creative process and the evolution of her design research.



Figure 1. Left: Thesis presentation overview, Level 4. Right: Conceptual inquiry & speculation, Level 4



Figure 2. Conceptual evolution and iteration, Level 3



Figure 3. Material exploration and experimentation, Level 2



Figure 4. Thesis synthesis and narrative, Level 1

The multi-level stairwell installation creates a sequential viewing experience that unfolds across four floors. Viewers encounter the work from varying angles, scales, and atmospheres as each level reveals distinct facets of the student's thesis development. The vertical organization encourages gradual discovery, requiring sustained attention and physical movement through the space. At Level 4 (Figure 1), viewers first grasp the overall research framework and development process. Level 3 (Figure 2) reveals the project's conceptual evolution and iterative process. Level 2 (Figure 3) invites haptic engagement with material and form experiments. At Level 1 (Figure 4), the final thesis narrative allows viewers to construct their own understanding of the student's creative journey.

The stairwell allows for unrestricted, fluid viewer movement. The multi-level arrangement illuminates multiplicity, with each level maintaining its distinctiveness while contributing to a coherent whole. Material experiments and haptic engagement demonstrate making as embodied practice. The playful verticality invites exploratory interaction rather than passive reception.

The physical movement required of viewers paralleled the intellectual journey the student had undertaken, transforming passive evaluation into active discovery. Viewers grasped conceptual frameworks through direct experience of vertical progression, material transitions, and atmospheric shifts between levels. The vertical distribution of the installation also revealed how spatial organization can embody pedagogical principles. By positioning different developmental phases across separate floors, the installation resisted conventional linear narratives that suggest creative development follows predetermined stages. Instead, viewers could enter at any level, discovering connections between phases in their own sequence. This non-hierarchical arrangement reflects the pedagogy's emphasis on individual paths of exploration. The public stairwell setting transformed what is typically a private academic evaluation into a shared cultural experience, allowing family members, peers, and broader communities to witness creative development as an ongoing process rather than a finished achievement. This shift from private critique to public engagement demonstrates the pedagogy's understanding that individuation occurs within and through community rather than in isolation.

The installation's temporal dimension made visible the sustained engagement necessary for authentic creative voice development. By requiring physical movement through time and space, the installation demonstrated that creative maturation cannot be rushed or compressed into efficient delivery systems. Viewers experienced firsthand how understanding deepens through patient, gradual engagement rather than rapid consumption of information. This embodied experience challenges educational models that prioritize fast skill acquisition over the slower, more reflective growth that characterizes genuine creative development.

Through this three-year development, students gain the capacity to engage in authentic creative performance that respects both individual cultural identity and collaborative peer engagement. The developmental sequence fosters continuous growth while maintaining connections to the core principles of cultural inclusion, creative authenticity, and collaborative exchange. These principles characterize the collective situation as a formless archive, sustaining the distinct values essential to interior design practice. This approach challenges conventional thesis formats that prioritize finished products over developmental processes, suggesting that interior design education might reimagine assessment itself as an opportunity for continued learning rather than final judgment.

CONCLUSION

This pedagogy demonstrates how reimagining the studio as a collective situation expands the potential of interior design from outcome-driven modalities toward authentic individuation as the ultimate goal of interior design education. Since prevailing social paradigms prioritize conformity, it is urgent to explore possible roles of interior design as self-reflective practice. This approach values subjectivity as the poetics of the interior, embracing difference as a catalyst for continuous authentic individuation.

This pedagogy delves into the relationship between individuation and interiorization by exploring how making allows students to encounter their own authenticity. As the three-year progression reveals, an authentic creative voice emerges not through predetermined competencies but through continuous encounter with difference, relation, and collaborative exchange via speculative play. The collective situation generates settings where individual subjectivity and collaborative culture complement rather than compete with each other.

Interiority is the poetics of embodiment. This is the foundational essence interior design should consider. Interiority is ephemeral and ambivalent yet genuine and experiential. It exists as a continuously evolving realm between the tangible and the intangible. As both archive and collective situation, it values the authenticity of both the individual and the community. This understanding of

interiority as both individual experience and collective cultural formation points toward possibilities for interior design practice that honors complexity while remaining accessible and experientially rich. The pedagogy described here offers not a final solution but an evolving framework for continuing inquiry into the purposes and possibilities of interior design education in times of cultural transformation.

NOTES

- ¹ Gilbert Simondon, *Individuation in Light of Notions of Form and Information*, trans. Taylor Adkins (Minneapolis: University of Minnesota Press, 2020), 50.
- ² Simondon, *Individuation in Light of Notions of Form and Information*, 7.
- ³ Gilles Deleuze and Felix Guattari, *Nomadology*, trans. Brian Massumi (South Pasadena, CA: Semiotext(e), 1986), 34.
- ⁴ Édouard Glissant, *Poetics of Relation*, trans. Betsy Wing (Ann Arbor: University of Michigan Press, 1997), 82.
- ⁵ Suzie Attiwill, "Interior, Practices of Interiorization, Interior Designs" (PhD diss., RMIT University, 2013), 69. <https://doi.org/10.25439/rmt.27581085>.
- ⁶ Gilles Deleuze, *Difference and Repetition*, trans. Paul Patton (New York: Columbia University Press, 1994), 45.
- ⁷ Richard Sennett, *The Craftsman* (London: Penguin Books, 2009), 227.
- ⁸ Gaston Bachelard, *The Poetics of Space*, trans. Maria Jolas (Boston: Beacon Press, 1994), 6.
- ⁹ Martin Heidegger, *What Is Called Thinking?* trans. J. Glenn Gray (New York: HarperCollins, 2004), 14.
- ¹⁰ Martin Heidegger, "Building Dwelling Thinking," in *Poetry, Language, Thought*, trans. Albert Hofstadter (New York: HarperCollins, 2001), 143.
- ¹¹ Drew Leder, *The Absent Body* (Chicago: University of Chicago Press, 1990), 83–85.
- ¹² Sennett, *The Craftsman*, 262.
- ¹³ Jacques Rancière, *The Ignorant Schoolmaster: Five Lessons in Intellectual Emancipation*, trans. Kristin Ross (Stanford, CA: Stanford University Press, 1991), 105.
- ¹⁴ Gilles Deleuze and Félix Guattari, *On the Line*, trans. John Johnston (New York: Semiotext(e), 1983), 86.
- ¹⁵ Rob Withagen and Simone R. Caljouw, "Aldo van Eyck's Playgrounds: Aesthetics, Affordances, and Creativity," *Frontiers in Psychology* 8, no. 1130 (2017): 7. <https://doi.org/10.3389/fpsyg.2017.01130>.
- ¹⁶ Rancière, *The Ignorant Schoolmaster*, 64.
- ¹⁷ Deleuze and Guattari, *On the Line*, 46.

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DETERMINING THE DRIVERS OF ACADEMIC PURSUIT IN LANDSCAPE ARCHITECTURE AT THE UNIVERSITY OF THE PHILIPPINES DILIMAN

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INTRODUCTION

Within the designed and built environment, Landscape Architecture (LA) remains a relatively new discipline, with limited research focused on landscape architecture education.¹ Existing studies have mainly examined curriculum design and specialization readiness, as well as career choices of LA graduates. However, these works leave a significant gap in understanding the factors that drive individuals to pursue and complete education in landscape architecture.

Landscape Architecture Across Southeast Asia

Historically, the landscape architecture profession evolved from associated fields such as architecture and agriculture, initially influenced by American and European practices. Its inception and progression in education and as a profession were driven by rapid urbanization of cities and the geographical context of different regions.

In the Philippine, four higher education institutions currently offer bachelor's degrees in landscape architecture: the University of the Philippines, University of San Carlos, Bulacan State University, and University of San Agustin.² Professional regulation began in 1985 under the Board of Architecture's Specialty Board for Landscape Architecture, later strengthened by Republic Act 9053 in 2001, which established an independent regulatory board.³

In Indonesia, three universities offer accredited LA program in independent departments, while others embed the discipline within architecture or planning programs. Professional recognition requires accredited education and minimum of two years of practice by the Indonesia Society of Landscape Architects.⁴ Thailand offers several five-year and four-year LA programs regulated by the Council of Architects, supported by the Thai Association of Landscape Architects. Despite formal regulation, dissatisfaction persists among graduates due to restrictive professional conditions, prompting many to seek opportunities abroad.⁵

In Singapore, the National University of Singapore offers the sole degree leading to professional accreditation through the Singapore Institute of Landscape Architects (SILA), supported by diploma programs in related institutions. Malaysia, by contrast, has more extensive network of universities offering LA education at all degree level, supported by the Institute of Landscape Architects, which actively promotes professional standards and public awareness.⁶

As of July 2022, the Philippines had roughly one landscape architecture for every 95 architects,⁷ underscoring the need to balance professional representation with the built environment. Understanding the motivation behind choosing landscape architecture as a field of study is essential to increasing qualified graduates and meeting future professional demand.

Theoretical Framework

Career choice is shaped by a combination of psychological and social influences. Social factors include family, parents, cultural background, role models, and environmental conditions, while psychological factors encompass perceptions, beliefs, interests, personality, and expectations about future work environments.⁸ These dimensions are explained by Social Cognitive Career Theory (SCCT), derived from Bandura's Social Cognitive Theory.⁹ SCCT highlights self-efficacy as a central mechanism influencing whether individuals pursue certain careers, how much effort they exert, how persistent they are, and how well they perform. Understanding how individuals form career choices provides a basis for improving professional education and practice.¹⁰

Another widely used framework in career decisions research is Expectancy-Value Theory (EVT). EVT explains persistence and choice by examining how individuals weigh their expectations for success against the value they assign to a task or field.¹¹ Matusovich et al. applied EVT in engineering education and found that students who persisted were driven by genuine interest, while non-persisters were often influenced by external pressures such as family expectations or perceived prestige.¹² Seymour and Hewitt similarly emphasized intrinsic curiosity as a key factor in sustaining persistence.¹³ These findings highlight persistence as a critical link between entry into a program and degree completion, an area that remains underexplored in landscape architecture education.

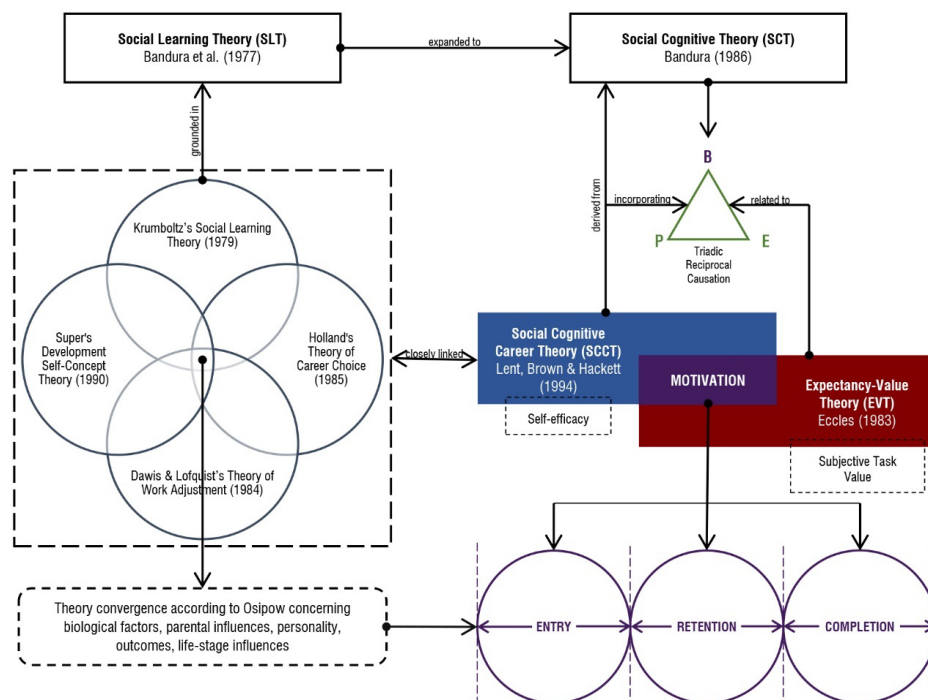


Figure 1. Integrated Theoretical Framework

Osipow argued that major career development theories converge around shared constructs, despite differing emphases.¹⁴ He identifies four influential theories: Krumboltz's Social Learning Theory, Holland's Theory of Career Choice, Super's Developmental Self-Concept Theory, and Dawis and

Lofquist's Theory of Work Adjustment. Across these theories, recurring themes include the influence of personal traits, learning experiences, environmental conditions, life stages, and perceived outcomes. Together, they suggest career choice emerges not from a single factor but through dynamic interaction between individual characteristics and contextual influences over time. This convergence supports the use of integrated frameworks when examining complex career decisions, such as persistence and completion in landscape architecture education, as illustrated in Figure 1.

Studies across related disciplines further demonstrates the interplay of intrinsic and extrinsic motivations. Research on architecture business, agriculture, and urban regional planning students show that personal interest is often the strongest driver of career choice, while salary expectations, role models, admission circumstances, and job prospects also shape decisions.¹⁵ These findings underscore how personal values and social contexts jointly influence educational trajectories.

METHODS

The first phase of the study utilized an online survey to examine the motivation influencing students to pursue, continue and complete landscape architecture education, together with their demographic and psychographic profiles. Surveys were considered appropriate for studying focused topics with limited empirical evidence.¹⁶ Moving beyond earlier studies that emphasized demographic correlations, this research integrated psychographic variables such as interests, values, self-efficacy, and perceived social and environmental influences.

The study population included undergraduate and graduate landscape architecture students at the University of the Philippines Diliman who were enrolled in the second semester of Academic Year 2021-2022. Stratified sampling was employed to ensure representation across undergraduate year levels and graduate programs. Undergraduate respondents were students enrolled in the Bachelor of Landscape Architecture (BLA), distributed across year levels. Graduate respondents included students enrolled in the Graduate Diploma in Landscape Studies (GDipLS) and the Master of Tropical Landscape Architecture (MTLA), with representation across entry, continuing and graduating stages. The questionnaire was administered online through Google Forms, with distribution supported by program directors and student organization, and supplemented by direct electronic communication. A pretest was conducted to refine the clarity, structure, and reliability of the instrument.

The survey was structured to follow the students' academic trajectory, addressing motivations at entry, during continuation, and toward completion of the program. Questions were predominantly close ended, with selected items adapted from earlier studies. Likert-scale questions were used to measure constructs such as motivation, perceived value, and self-efficacy.

Phase two employed focus group discussion (FGD) and key informant interviews (KII) to contextualize and validate the quantitative finding. The online FGD was conducted with a group of LA faculty members who have direct engagement with students enrolled in the landscape architecture programs offered at UP Diliman. KII involved the head of the Commission on Higher Education - Technical Committee for Landscape Architecture (CHED-TCLA) who is knowledgeable about implementation of the program.

Data triangulation integrated findings from the literature review, survey results, FGD, and KII to improve validity and credibility.¹⁷ Quantitative data were analysed using Spearman's Rho correlation to determine relationships between motivational, demographic, and psychographic variables, with statistical significance set at $p < 0.05$. Analysis of Variance (ANOVA) was employed to compare means, with significance at $p < 0.10$. Overall, p-values below thresholds indicate statistically significant findings, though strength and direction require careful interpretation.

RESULTS

A total of 67 valid responses were collected through the online survey, consisting of 43 undergraduate students (38 percent of 114 enrolled), and 24 graduate students (73 percent of 33 enrolled).

Table 1 summarizes factors influencing undergraduate students' entry, retention, and completion using literature review, online survey results, and FGD and KII findings. Entry is shaped by parental influence, parents' educational attainment, financial support, and encouragement by mentors, reflecting strong extrinsic and social influences. Retention is associated with educational financial support, household income, peer encouragement, exposure to environmental issues, and growing awareness of professional opportunities. Completion is linked to personal skills, motivation related to salary and career opportunities, parental occupational background, and supportive learning environments. Across phases, quantitative associations align with qualitative accounts, highlighting recurring roles of motivation, family background, and social influence.

Entry			
Literature Review	Online Survey	FGD & KII	Key Themes
• Parental Influence¹⁸ • Father¹⁹ • Parent's education achievement level²⁰ • Chance to earn money²¹ • Extrinsic motivation²²	<u>Spearman's Rho</u> • Encouragement by mentor (p = 0.01) • Household income contribution (p = 0.02) • Educational financial support (p = 0.04) <u>Analysis of Variance</u> • Father's educational attainment (p = 0.02) • Motivation ranking: Good salary (p = 0.07)	• Path to Architecture • Family background • UP education • Monetary benefit/ Financial gain • Employability • Environmental problems and issues	<u>Extrinsic Motivation</u> • Monetary benefits and career opportunities <u>Personal Influence</u> • Household and parents/ family background <u>Social Influence</u> • Encouragement of mentors
Retention			
Gap in the literature	<u>Spearman's Rho</u> • Father's educational attainment (p = 0.05) • Educational financial support (p = 0.03) <u>Analysis of Variance</u> • Household income contribution (p = 0.05) • Encouragement by friend (p = 0.08) • Opportunity to address environmental problems (p = 0.09)	• Becoming aware of the opportunities and benefit • Becoming aware of the demand for landscape architects • Exposure to trends and environmental issues • Activities and collaborations • Encouragement	<u>Intrinsic Motivation</u> • Understanding the value of the profession <u>Personal Influence</u> • Household and parents/ family background <u>Social Influence</u> • Encouragement of friends and professors, and collaborative activities
Completion			
Gap in the literature	<u>Spearman's Rho</u> • Personal skills rating: Social skills (p = 0.02) • Combined household income (p = 0.04) • Motivation ranking: Good salary (p = 0.01) <u>Analysis of Variance</u> • Mother's occupational field (p = 0.03) • Personal skills rating: Time management (p = 0.02) • Motivation ranking: Career opportunities (p = 0.04) • Field of work: Planning/management/ policy (p = 0.02)	• Good presentation and communication skills • Participative • Openness to receive feedback • Good leadership skills • Confident • Good researching skills • Desirable faculty-student ratio • Adequate facilities	<u>Extrinsic Motivation</u> • Monetary benefits and career opportunities <u>Personal Influence</u> • Household and parents/ family background <u>Self-Efficacy</u> • Graduating students find themselves good at skills required in the program

Table 1. Factors Influencing Undergraduate Students

Among the undergraduate student respondents, 49 percent reside outside Metro Manila, while 32 percent live outside Quezon City and 19 percent within the city. Childhood hometowns were predominantly urban (44 percent), shifting to a more urban current residence (53 percent). Most fathers (75 percent) and mothers (84 percent) are college graduates, with parents commonly engaged in professional or managerial work. Household incomes were distributed across middle to upper-income brackets, with 23 percent earning ₱43,828 (746 USD) to ₱76,669 (1,305 USD) monthly. Nearly all respondents (98 percent) reported financial support from household members.

Table 2 presents factors influencing graduate students. Entry is associated with occupational status, household income, mentor encouragement, hometown, and the reputation of the LA program, highlighting extrinsic, personal, and social influences. Retention is shaped by self-supporting education, income contribution, time management skills, professional awareness, and exposure to trends and environmental issues, reflecting intrinsic motivation and self-efficacy. Completion is linked to creativity, leadership and management skills, motivation for good salary, social skills, and supportive academic conditions, reinforcing the role of extrinsic motivation and self-efficacy.

Entry			
Literature Review	Online Survey	FGD & KII	Key Themes
Gap in the literature	<u>Spearman's Rho</u> - Occupational status (p = 0.00) - Household income contribution (p = 0.02) - Encouragement by mentor (p = 0.01) <u>Analysis of Variance</u> - Current hometown (p = 0.05) - Motivation ranking: Reputation of LA program (p = 0.03)	- Professional background - Monetary benefits - Professional enrichment	<u>Extrinsic Motivation</u> - Monetary benefits and career opportunities <u>Personal Influence</u> - Household and parents/ family background <u>Social Influence</u> - Encouragement of mentors
Retention			
Gap in the literature	<u>Spearman's Rho</u> - Self-supporting education (p = 0.03) - Household income contribution (p = 0.02) - Occupational status (p = 0.00) - Personal skills rating: Time management (p = 0.03) <u>Analysis of Variance</u> - Current hometown (p = 0.08)	- Becoming aware of the opportunities and benefit - Becoming aware of the demand for landscape architects - Exposure to trends and environmental issues - Activities and collaborations - Encouragement	<u>Intrinsic Motivation</u> - Understanding the value of the profession <u>Personal Influence</u> - Household and parents/ family background <u>Social Influence</u> - Encouragement of professors <u>Self-Efficacy</u> - Finding themselves good at skills required in the program
Completion			
Gap in the literature	<u>Spearman's Rho</u> - Personal skills rating: Creativity (p = 0.02) - Leadership and management (p = 0.04) - Motivation ranking: Good salary (p = 0.01) <u>Analysis of Variance</u> - Social skills (p = 0.09)	- Good presentation and communication skills - Participative - Openness to receive feedback - Good leadership skills - Confident - Good researching skills - Desirable faculty-student ratio - Adequate facilities	<u>Extrinsic Motivation</u> - Monetary benefits and career opportunities <u>Self-Efficacy</u> - Finding themselves good at skills required in the program

Table 2. Factors Influencing Graduate Students

The graduate student respondents are geographically diverse, with 63 percent residing outside Metro Manila and a shift from predominantly suburban childhood hometowns (50 percent) to urban current residence (54 percent). Parents are largely college educated, with 54 percent of fathers and 79 percent

of mothers holding college degrees, many in professional roles. Monthly household income cluster in the middle to upper ranges, led by ₱76,669 (1,305 USD) to ₱131,484 (2,238 USD) at 34 percent, followed by ₱131,484 (2,238 USD) to ₱219,140 (3,730 USD) at 29 percent. Financial independence is pronounced, with 75 percent primarily self-support their education, with limited reliance on family or external assistance.

DISCUSSION

Undergraduate Student Progression

Entry into LA programs is significantly influenced by father's educational attainment, household financial status, and high school mentor encouragement. Students financially dependent on families find enrolment directly correlated with household capacity to fund education. Notably, fathers with college degrees demonstrate stronger correlation with student entry, reflecting both financial capacity and educational value modelling. FGD participants confirmed that students frequently come from architecture or engineering family backgrounds, emphasizing parental professional context influence. High school mentors play equally critical roles in undergraduate entry. College entry follows secondary education completion, making junior and senior high school teachers primary academic influences before program selection. FGD participants emphasized that mentors' ability to convey profession importance and value directly influences student career choices. This finding aligns with Powers, who asserts that targeted secondary education marketing is essential, given widespread lack of understanding about LA as a profession.²³ Salary motivation emerges as significant entry factor. Students yearn for well-paying careers to eventually contribute to household finances rather than remain dependent. FGD data confirmed monetary benefits as primary entering motivation, while KII identified financial gain as primary student driver. However, geographic variation exists – while Philippine and Iranian students prioritize earning potential, U.S. LA students demonstrate stronger intrinsic motivation.²⁴ This diversity suggests cultural factors shape motivation importance differently across contexts.

Program continuation patterns mirror entry factors yet show notable evolution. Fathers' educational attainment continues motivating persistent students who aspire to equal or greater achievement levels. Financial support remains essential for basic living expenses despite scholarships. Critically, friends' encouragement gains significance during continuation, replacing mentors' influence. FGD participants described LA as “fun,” emphasizing collaborative activities and student charettes. This peer support system development demonstrates social influence strengthening as students progress.

Environmental motivation dramatically increases during continuation. Whereas entering students prioritize salary, continuing students become increasingly intrinsically motivated toward environmental problem-solving. FGD participants emphasized exposing students to environmental issues, enabling awareness of landscape architects' significance in addressing current challenges. This motivation shift validates EVT's intrinsic value concept—personal interest closely links with task persistence, explaining why environmentally engaged students demonstrate stronger retention.

Program completion depends on multiple interconnected factors. Mothers' professional occupation significantly predict completion, with students viewing such occupation as aspirational achievement targets. Combined with lower middle income household correlation, findings suggest students perceive LA as household economic contribution pathways. Self-efficacy emerges as crucial completion factors. Students who demonstrate competence across nine skill areas—time management, communication (visual and verbal), social skills, problem-solving, creativity, leadership, gardening, and design software proficiency—show significantly higher likelihood of program completion. High self-assessment in these skills is linked to strong self-efficacy, supporting SCCT's premise that domain-specific self-efficacy enhances persistence in academic and professional tasks.

Gardening skill competency notably correlates with program completion, potentially reflecting the COVID-19 pandemic period when plant purchasing and online gardening surged.²⁵ Career opportunities and salary motivations also remain significant at completion, as students anticipate employment realities and extrinsic rewards. Moreover, those pursuing planning, management or policy careers demonstrate the strongest completion rates, suggesting curricular emphasis in these fields enhances overall program completion.

Graduate Student Progression

Entry of graduate students fundamentally differs from undergraduate pathways. Employment status and income contribution are critical, reflecting financial independence from families. Unlike undergraduates, prior work experience and current employment directly enable financing of post-graduate education. Mentor encouragement extends beyond professors to include employers, some offering financial support for credential enhancement. Program reputation also influences entry decisions, as student value enrolment's impact on professional network and career advancement. Urban residence proximity predicts entry, with accessibility reducing transportation costs for working professionals.

Continuation and completion similarly reflect employment stability and time management capability. Being employed and contributing to household income sustains persistence, while time management proves vital given competing work-school demands. Completion depends on social skills, leadership capability, creativity and design software proficiency, particularly relevant to architecture, horticulture, and forestry backgrounds. Salary motivation remains significant, with extrinsic rewards driving completion through anticipated promotions and appraisals. Importantly, graduate students maintain primarily extrinsic motivation throughout their program trajectory, contrasting with undergraduates' shifts toward intrinsic environmental values.

CONCLUSION

This study identified distinct entry, retention, and completion factors for undergraduate and graduate LA students at UP Diliman. Undergraduate pursuit is driven by parental background, household financial capacity, high school mentor encouragement, salary motivation, environmental concern, and self-efficacy. On the other hand, graduate pursuit is driven by occupational status, employer/mentor encouragement, program reputation, salary/career advancement potential, and professional skills confidence.

Critical insights emerged regarding motivation evolution: undergraduate students shift from extrinsic to intrinsic motivation as they progress, while graduate students maintain extrinsic motivation throughout. Parental influence, particularly maternal professional occupations, proved more significant than prior research suggested. Self-efficacy beliefs strongly predicted program completion across both populations, underscoring confidence in domain-specific abilities as essential for persistence and success.

These findings suggest targeted interventions: engagement of secondary educators in LA promotion, cultivation of collaborative peer support systems within program, explicit integration of environmental stewardship into curriculum, and strategic recruitment of allied professionals for graduate programs.

The value and significance of landscape architect as an environmental stewardship profession must be instilled early in student education, allowing students to view the field not merely as a pathway to financial security but as a meaningful contribution to environmental protection and sustainable development.

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CREATING AI-AWARE CURRICULA FOR INNOVATION AND CRITICAL THINKING IN INTERIOR DESIGN

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INTRODUCTION

Artificial Intelligence (AI) is reshaping various industries, including interior design, proving to be a vital tool for professionals.¹ The College of Design's School of Interiors is proactively integrating AI into its curriculum, equipping students with the skills to navigate this technological evolution. Throughout the four years of study, AI is integrated into the curriculum to enhance learning experiences. In the first year, students explore AI within a History and Theory course, introducing them to various tools and prompting discussions on ethical implications. This foundational knowledge encourages students to reflect on originality and the ethics of AI usage. In the second year, students participate in projects where AI aids in synthesizing their ideas and presenting design concepts, highlighting practical applications in the design process. As they move into the third year, assignments in their final theory course emphasize critical writing skills. One key assignment involves students writing about a sensory experience and using AI to attempt its recreation, fostering an understanding of their unique writing voices and the ethical concerns related to AI-generated content.² The fourth year culminates in a workshop focused on AI image generation for the conceptual development of capstone projects. Some students successfully integrate AI imagery into their work, illustrating the potential role of AI in interior design. As AI technologies progress, instructors are continuously adapting the curriculum to reflect these changes. This comprehensive approach ensures graduates possess the confidence to leverage AI in their careers while promoting innovation and critical thinking.

AI, Interior, and Design Pedagogy

This technological moment is reminiscent of the 2000s, a period when the internet was expanding faster than our ability to make sense of it. Our connection to artificial intelligence reflects a comparable dynamic: the tools are advancing rapidly while institutions are scrambling to keep pace with this paradigm shift.³ In design education, instructors know that students are already using AI tools, but they find it challenging to formally address a constantly changing landscape. This paper, therefore, does not focus on whether to use AI, but on how to intentionally incorporate generative AI into design education as a meaningful resource that enhances creativity, fosters collaboration, and remains grounded in human-centered design practice.

As a learning tool, generative AI can enhance students' visual literacy and improve their descriptive capacity.⁴ Though our focus is on interiors and design, these skills translate across many creative and

professional disciplines because they're rooted in language, visual storytelling, and the ability to transform conceptual ideas into tangible experience. Furthermore, describing a discipline like interior design as human-centered does not mean that design educators should dismiss technological curiosity. Both can coexist. The design scholar Christine Cantwell describes how literature and art are useful "vehicles of perception" in that they communicate certain poetic aspects of space beyond their Cartesian three dimensions.⁵ To that end, AI may help interior design students visualize and communicate aspects of human experience in new ways. Can we view it as simply another tool or artistic medium?

With this in mind, it's important to set clear parameters. AI is an instrument and not a solution.⁶ It cannot replace the essence of design thinking, it can't create physical space, and it can't yet be relied upon to produce accurate, measured drawings or consider human health, safety, and welfare. Students must learn to use AI and intentionally, not by chance. Moreover, their engagement with it should enhance their design process rather than substitute for the judgment, accuracy, and responsibility required in real-world interior design.⁷

Themes and tensions

While there are probably more questions than answers, it is worth highlighting some emerging themes and tensions that have been observed in this process:

Language to Image Translation

How does good, descriptive writing shape the visuals AI produces, and through this process, design? What makes a detailed, descriptive prompt? How does this fit within design curricula?

Interior Design Workflow

Where is AI actually useful in the interior design process, and how do we turn atmospheric images into real materials and dimensions? Where does it genuinely excel and fall short, especially around precision, scale, and constructability?

Ethical Considerations

How do we teach students to critique the machine as much as they use it? This naturally brings up natural questions of attribution and authorship.

Core Competencies and Skill Building

Addressing these issues necessitated the development of core competencies which serve as strategic pillars to guide how our program integrates generative AI into interior and design education.⁸ These competencies manifest as tools and techniques applied through specific exercises.

Pillar one is Understanding. This is the early sandbox phase, where students build basic fluency in front-end tools through experimentation. Students learn how to use AI as a tool for language, iterative design processes, and atmospheric ideation. Some techniques include prompt writing, alt-text, image generation, descriptive language and visual thinking.

Reflecting, pillar two, is parallel to skill-building, which encourages students to critically question, reflect, and situate their use of generative AI, including how their biases, authorship, and ethical responsibilities factor into it. They develop critical literacy, asking questions like whose interiors does AI reproduce? What's missing? And what are its boundaries in academic use?

The last pillar of Applying builds upon the other two, with students using AI to test specific ideas for their independent design work. This outermost horizon of inquiry asks how student learning can translate into both conceptual and later stage design projects. This includes writing complex spatial

descriptions making decisions what to take forward, from the initial atmospheric imagery into an actual space or project.

CURRICULUM ARC

Currently, here is how the pillars are mapped out as specific exercises across the curriculum:

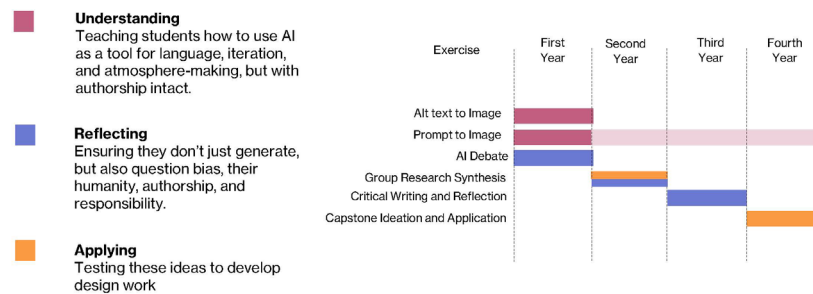


Figure 1. Curriculum Arc.

Across the sequence, year one focuses on basic understanding, followed by year two on application and reflection. Year three moves into deeper, more focused reflection, followed by year four, in which students apply the skills they have learned to a capstone design project oriented toward the profession. Through this structure, advancing understanding continues through all four years. However, as tools continually evolve, there are opportunities to revisit fundamental skill-building throughout all four years. The remainder of the paper will focus on the selection of exercises over the years in greater detail.

First Year: AI Week

The first-year History/Theory course is organized into units that include theories, technology, finishes, furnishings, and storytelling. AI week is a crucial part of the technology unit and consists of tool exploration, visualization, and descriptive writing. This is immediately followed by activities oriented toward reflection and discussion. The first exercise is titled *Text to Image* where students choose an image of a space and try to describe it through a brief alt text caption. The exploration of alt text here connects to the program's broader goal to consider issues of accessibility in design, alongside improving the students' ability to describe space with few but meaningful words. To be accessible, such captions should remain factual and non-interpretive. The students are then asked to translate their alt text into a prompt for an AI language model of their choice (such as Midjourney, ChatGPT or Google's ImageFX) in order to replicate their original image. Getting a successful recreation of the original image requires students to expand their brief alt text into writing that is a lot more descriptive, and possibly emotive, encouraging them to utilize their evolving design vocabulary and to describe qualitative aspects about the space, including the ideas of taste, atmosphere, emotion, light quality, scale, material specificity, and cultural references. The students then compare their original image to the AI-generated version. Through the side-by-side comparison, we ask the students what they added, what assumptions they made, and perhaps what they chose to omit.

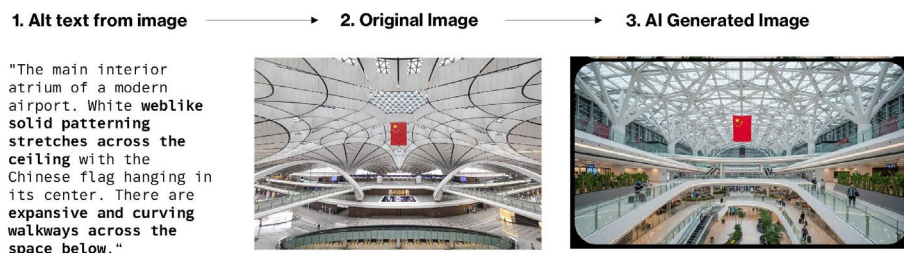


Figure 2. Text to Image Assignment.

The week then concludes with an in-class debate and written reflection to reinforce that AI use in design education must be intentional and critically examined. The debate asked students a simple question: should AI be allowed in design education? Why or why not? Students were divided into two groups, with a couple of students selected to play reporters and judges. This created a lively atmosphere and culminated in the creation of a newspaper by the reporters who described the issues, tensions, and complexities of the debate in greater detail.



Figure 3. AI Debate Newsletters.

All students then reflected independently through writing, and on the last day the class collectively discussed the tool's bias implications. Some discussion topics included why AI interiors default to western, minimalist or luxury aesthetics, what aspects of messy, everyday experiences don't show up in training data, and who the designer is, if the machine produces the image.⁹ Ethical exploration was not a separate lecture, but ran parallel to experimentation, with the goal being that if students can use the tool, they must be able to question it.

Second Year: Individual and Group Research Synthesis

In the second year, the students utilize the skills and experiments from year one but shift from individual to collective design scenarios. AI here is used as a shared tool for group work. The project of the second year design studio is titled *Jenga*, with each student's individual work serving as a conceptual building block to a larger collaborative project. Initially, students work independently, then are placed in small groups to synthesize their individual concepts into a set of ideas for a single classroom space. The task here is to develop multiple design options, including interior layouts, material studies and atmospheric tests, using AI for rapid design iteration and comparison. What matters is not the images, but the conversation around them. AI thus becomes a tool for collaboration, research synthesis and peer critique, rather than for personal output.¹⁰ Like the game of Jenga, this exercise becomes increasingly more complex. Finally, the students in the entire studio are asked to

synthesize their ideas into a single set of classroom designs for a learning complex. Year two thus moves beyond year one from learning to use the tool to learning how to co-create, edit, and even discard ideas. AI plays a contributing role here, but the students remain the authors, strengthening their discernment and judgment along the way.



Figure 4. Individual versus Group Prompts and Image Results.

The tensions that emerged in the student reflections help highlight AI's limitations and appropriateness of use. One student wrote that "the use of AI speeds up the design process when generating ideas, but the image generated doesn't fully fit our concept." Another wrote that "AI does not think about people using the space and lacks practical design knowledge such as the ADA guidelines," highlighting issues of accessibility, and perhaps an inability to actually be truly human centered. This last example critiques the use of AI as a collaborator in the design process. "The AI included many more real specifications which was helpful to remind me what to include. There are downfalls to this method though as it removes the pure customization and human intention from design." While the student got some material ideas, they acknowledged a lack of "human intention" in the machine's choices.

Third Year: Reflecting on AI Use in the Classroom

In the third year, the concept of ethics becomes much more rigorous through a writing assignment called *Reverse Engineering a Sensory Memory* that asks students to recognize how AI mediates their writing voice, and to reflect on when, how, and whether to use it. Students first write a detailed account of a sensory memory of an interior—things like sound, temperature, light quality, textures, and smells. Afterwards, they convert their personal writing into a descriptive prompt, in order to get the machine to replicate their original description. In the third part, the students reflect on the differences between their original human writing and the AI replication to ask what AI may have emphasized, flattened, or invited, including what aspects of their personal memory resisted replication. These questions helped students question where their own authorship as writers resides. It also brought up questions about the responsibilities that arise when translating human lived experience into machine-generated narratives. Such an exercise in critical literacy aims to recognize AI's role in mediating or transforming uniquely human expression, in a world where human subjectivity seems to be declining everyday.

In the first two parts of the exercise, a student writes about their experience at a mall in Florida: "I walk into the bustling mall, pushing past people to my left and right. As I look around, I see people from all walks of life, sitting at tables, waiting in lines, and walking swiftly into stores...I smell a

strange mix of food court restaurants, ranging from pizza, to chicken patties, to Chinese steak and broccoli. The combination of smells makes me even less hungry, and more eager to evade people into a less crowded area.” In the second portion, it is apparent that the student’s sensory writing is translated into something close, but not their own. The AI tool writes: “Stepping into the mall in Florida is a rush of contrasting sensations, though the cool, air-conditioned interior is a welcome relief from the sweltering heat outside...The atmosphere feels thick with the savory, greasy aromas of fast food—fries sizzling in oil, burgers on the grill, and the unmistakable scent of fried chicken wafting through the air.” Looking at the two passages, the AI version generalizes her nuance into a creative, descriptive piece of writing, but it omits her experience of the strange smells mixing together, and her loss of appetite. There is a gestalt of sameness, but also of her perspective.

The student in her reflection observed how AI could not replicate their voice, how it embellished, and used words and syntax that did not sound like her. “As far as my unique writing voice, AI could not replicate it...While I enjoy using flowery language when I write, I feel like the AI generated paragraph uses much more embellished language to describe things.” They also articulated their ethical concerns, including the academic and environmental implications. Lastly, the student realizes that using the tool does not bring them any closer to the outcome, and that it can be seen as another form of labor. “Is it worth how long it takes for an AI program to generate your specific idea? In some cases, I feel it would be quicker for us to write it ourselves, without AI.” The assignment thus aims to discourage AI misuse in academic writing by allowing students to safely experiment with the tool's limits and reflect on their choices.

Fourth Year: Applying

In the final year—the capstone—students attended an in-class refresher workshop on several AI tools to deepen their understanding of new tools and their capabilities. (AI tools were extremely new when this cohort started university, so a refresher was necessary.) They were then encouraged to experiment with applying it to their capstone projects. The capstone studio is similar to a thesis, where each student independently develops a project of their choice in depth. By their fourth year, the students have enough experience to decide when AI belongs in their process and when it doesn’t. They are also more experienced at identifying which elements require description to elicit a specific space. This is evident in their ability to write descriptive prompts.

“Atrium area for community centers that **focuses on influencing social interactions and diversity**. This center is located within a **segregated community** and acts as a **tangible solution**. For this space, it uses **warm tones like red, orange, yellow, and brown** with an **analogous color palette**. It also uses **natural and sustainable materials** to align with the palette. This space is **two floors** and has a lot of **natural lighting**.”



Figure 5. Fourth Year Prompt and AI Concept Images.

In the prompt on the left, the student describes an atrium for a community center, designed to foster social interaction and diversity. They then describe where the center is located and what it represents to the community. In their description, they are not merely describing the image, but exploring atmosphere and narrative, including the quality of light, the finishes, and the analogous color palette to describe the emotional tone that the interior should hold. The student generated many variations on

what the interior could look like, but—importantly—they never treated them as finished work, and included the AI prompt in her final concept design submission. This is a key lesson the curriculum emphasizes about the use of AI: it can inform the work, but it cannot replace authorship, scale, detail, or the craft of creating a real interior space.

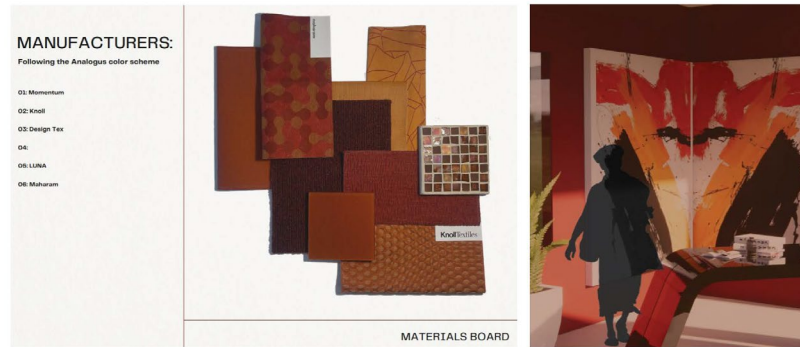


Figure 6. Capstone Materials and Rendering – No AI used here.

The student's final project ended up looking quite different from their original AI ideations, but it is possible to tell that it was a core part of their process in developing it. It is evident in how perhaps their choice of materials, or even their interior renderings, were impacted by her early generative AI image making.

CONCLUSION

Across the four-year arc, AI is positioned as a medium for language and atmosphere, rather than as an automated design solution. When AI is introduced early, alongside debate and reflection, and then further developed through research and writing, students can develop sufficient discernment to identify where AI actually helps and where certain disciplinary guardrails must remain. As the students gain this experience, they increasingly develop selective and intentional use, or even deliberate non-use. AI-aware design curricula thus have the potential to strengthen human-centered design judgment by reinforcing the qualities that make human creativity unique, through making authorship, ethics, and responsibility explicit learning outcomes. Zooming out beyond the classroom, institutions appear to be experimenting without a clear consensus, and disciplines use AI differently. In the interior design profession, practitioners report that it's primarily used for business writing: proposals, client emails, marketing language, presentations, and editing text, with limited use in drawing, detailing, or construction documentation. Some designers may use it for mood imagery or early conceptual visuals, but the material, dimensional, or code-based aspects of practice remain relatively unexplored. As this continues to evolve, students are trying to understand what it means to use AI both ethically and imaginatively during this transitional period. Finally, AI doesn't free us from being designers or educators. Instead, it asks us to become even more intentional about how we create, what we choose, and who is included in our imaginings. Our hope is for students not fear these tools or blindly depend on them. Ultimately, how we choose to use this rapidly evolving artificial intelligence will influence its future.

NOTES

- ¹ Yaren Şekerci et al., “Enhancing Interior Design Education with Artificial Intelligence: A Multisensory Hotel Design,” *Interiors : Design, Architecture, Culture* 13, nos. 2–3 (2023): 195–229, <https://doi.org/10.1080/20419112.2024.2409504>.
- ² Naomi S. Baron, *Who Wrote This?: How AI and the Lure of Efficiency Threaten Human Writing* (Stanford University Press, 2023).
- ³ Fabio Andres Tellez, “Reflecting on the Integration of Generative AI in Design Education: Lessons from the Field,” *Voces y Silencios, Revista Latinoamericana de Educación* 16, no. 2 (2025): 169–91, <https://doi.org/10.18175/VyS16.2.2025.9>.
- ⁴ Jing Li et al., “Enhancing Visual Communication Design Education: Integrating AI in Collaborative Teaching Strategies,” *Journal of Computational Methods in Sciences and Engineering* (London, England) 24, nos. 4–5 (2024): 2469–83, <https://doi.org/10.3233/JCM-247471>.
- ⁵ Christine Cantwell, “Phenomenology and the Senses in Interiors,” in *The Handbook of Interior Architecture and Design*, with Lois Weinthal and Graeme Brooker (Bloomsbury Publishing Plc, 2013), <https://doi.org/10.5040/9781474294096.ch-038>.
- ⁶ Stephanie Hare, *Technology Is Not Neutral: A Short Guide to Technology Ethics*, (London: London Publishing Partnership, 2022).
- ⁷ Naomi S. Baron, *Who Wrote This?: How AI and the Lure of Efficiency Threaten Human Writing* (Stanford University Press, 2023).
- ⁸ Michelle Renée Zimmerman, *Teaching AI: Exploring New Frontiers for Learning* (International Society for Technology in Education, 2018).
- ⁹ Stephanie Hare, *Technology Is Not Neutral: A Short Guide to Technology Ethics* (London: London Publishing Partnership, 2022); Naomi S. Baron, *Who Wrote This? How AI and the Lure of Efficiency Threaten Human Writing* (Redwood City, CA: Stanford University Press, 2023).
- ¹⁰ Jing Li et al., “Enhancing Visual Communication Design Education: Integrating AI in Collaborative Teaching Strategies,” *Journal of Computational Methods in Sciences and Engineering* (London, England) 24, nos. 4–5 (2024): 2469–83, <https://doi.org/10.3233/JCM-247471>.

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INTERIOR URBANISMS: TEACHING FROM THE CITY-INSIDE-OUT_ A PEDAGOGY OF SITUATED PRACTICE IN INTERIOR DESIGN EDUCATION

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INTRODUCTION

Across global design education, there is increasing pressure for universities to respond meaningfully to complex urban crises: spatial inequality, climate precarity, social fragmentation, and contested heritage. These pressures are particularly acute in the Global South, where historical injustices are spatially embedded and continue to shape everyday urban experience. In South Africa, apartheid-era planning legacies remain visible in the form of fragmented cities, unequal access to resources, and deeply segregated spatial systems. Within this context, Interior Design education faces a critical pedagogical challenge: how can a discipline; historically associated with enclosed, commodified, and privately commissioned spaces; reposition itself as socially relevant, ethically engaged, and urban in scope?

This paper argues that interior design pedagogy must be reoriented away from isolated studio abstraction toward situated, urban, and civic engagement. Drawing on the restructuring of the Interior Design Honours programme at the University of Johannesburg, the paper presents an alternative pedagogical model termed *interior urbanism*. This approach frames the city itself as an interior condition; layered, inhabited, and negotiated, and positions interior design students as active participants in urban transformation rather than passive service providers.

The argument is developed through three intertwined lenses: (1) theoretical shifts in design pedagogy toward situated and critical learning; (2) the urban South African context as both constraint and catalyst for pedagogical innovation; and (3) the integration of emerging digital technologies as critical tools for urban engagement. Together, these lenses articulate a pedagogy that teaches *from the city-inside-out*, collapsing boundaries between interior and urban, academic and civic, and learning and practice.

THEORETICAL FOUNDATIONS: SITUATED LEARNING, CRITICAL PEDAGOGY, AND THE URBAN TURN

This paper draws on three overlapping bodies of theory to frame *interior urbanism* as a pedagogical position rather than a stylistic or thematic approach: (1) situated learning and practice-based education, (2) critical pedagogy and spatial justice, and (3) the urban turn in interior and architectural theory. Together, these frameworks support a shift away from isolated, object-focused studio teaching toward a mode of education that is embedded in context, relational in method, and civic in intent.

From studio isolation to situated practice

The design studio has long been the core of design education, yet it has also been widely critiqued for reproducing professional hierarchies, privileging individual authorship, and distancing students from the social, political, and material realities of practice.¹ Schön's² influential concept of the reflective practitioner framed studio learning as a conversation with materials and drawings, but subsequent scholars have noted that this model often remains inward-looking, operating within closed pedagogical systems that simulate practice rather than engage it.

Situated learning theory, articulated by Lave and Wenger,³ provides a critical alternative. Knowledge, in this framework, is not transferred from expert to novice but produced through participation in communities of practice. Learning is therefore inseparable from context, social interaction, and shared activity. In design education, this has catalysed a shift toward live projects, community-engaged studios, and research-led teaching models that expose students to uncertainty, negotiation, and ethical complexity.⁴

Scholars such as Till⁵ argue that architecture and design must move away from autonomous object production toward *spatial agency*, where designers act as facilitators, translators, and mediators rather than sole authors. Awan, Schneider, and Till⁶ further position design as a relational practice embedded in social and political processes. Interior urbanism extends this argument by recognising that interior design, traditionally framed as small-scale or secondary, already operates through relational systems of use, occupation, and negotiation. Teaching interiors in isolation from urban conditions, therefore, misrepresents the true scope of the discipline.

By situating studio learning within live urban contexts, students are exposed to the messy realities of practice early in their education. They must negotiate with users, histories, and constraints that cannot be resolved through form alone. This aligns with what Nicol and Pilling⁷ describe as *learning through uncertainty*, a condition essential for educating designers capable of working in complex cities. In interior urbanism, the city becomes a distributed studio, and learning emerges through engagement rather than simulation.

Critical pedagogy and spatial justice

Critical pedagogy, rooted in the work of Freire (1970),⁸ positions education as a practice of freedom, in which learners become aware of power relations and their capacity to intervene in oppressive systems.⁹ Rather than treating students as passive recipients of knowledge, critical pedagogy insists on dialogue, reflexivity, and ethical responsibility. Within spatial disciplines, this approach has been taken up through debates on spatial justice, the right to the city, and the political nature of design decisions.¹⁰

Spatial justice provides a particularly important lens for interior design education in unequal cities. Design decisions about access, thresholds, visibility, comfort, and inclusion directly shape who belongs and who is excluded from space. Teaching students to recognise these dynamics requires more than technical competence; it demands critical awareness and ethical positioning. As Crawford¹¹ and Petrescu¹² argue, participatory and community-based practices are not supplementary to design education but essential to its legitimacy in contemporary society.

In South Africa, the need for such a pedagogy is urgent. As Harrison, Todes, and Watson¹³ demonstrate, urban form in the country remains deeply entangled with apartheid planning logics, producing persistent inequality and fragmentation. Teaching interior design without engaging this history risks reproducing what Mbembe¹⁴ describes as spatial amnesia; an erasure of the political conditions that produced contemporary space. Interior urbanism, therefore, embeds critical reflection directly into studio projects, requiring students to confront histories of displacement, exclusion, and resilience embedded within the sites they occupy.

This approach also aligns with decolonial perspectives on design education, which call for curricula that are situated, plural, and accountable to local realities rather than imported models.¹⁵ By working in real urban contexts, students are forced to grapple with the ethical implications of design and to recognise their own positionality within systems of power. Learning becomes not only a professional exercise, but a civic one.

The urban turn in interior design theory

Over the past two decades, interior design theory has undergone what might be described as an *urban turn*. Scholars have increasingly challenged the binary separation between interior and urban space, arguing that interiors are not simply enclosed rooms but spatial conditions that extend across scales and boundaries. Attiwill¹⁶ conceptualises interiors as dynamic, relational fields shaped by occupation, movement, and atmosphere rather than walls alone. Similarly, Rice¹⁷ demonstrates how interior logics operate at the scale of the city, particularly in large urban developments and hybrid public-private environments.

The concept of *urban interiority* further expands this understanding, recognising streets, transit spaces, markets, libraries, and even informal settlements as interior-like environments that are designed, regulated, and inhabited. This resonates with Franck and Stevens's¹⁸ work on loose space, where urban interiors emerge through use rather than formal designation, and with Meagher's¹⁹ research on everyday interiors in informal economies.

Interior urbanism builds on this theoretical turn but reframes it pedagogically. Rather than treating urban interiors as a topic of study alone, it positions them as a teaching method. The city becomes a pedagogical device through which students learn to read, interpret, and intervene in complex spatial systems (as illustrated in the design in Figure 1). The interior designer, in this model, becomes an interpreter of urban life; working across thresholds, scales, and disciplines to produce spaces that support social and civic life.

This theoretical positioning allows interior design education to claim a more expansive role in debates on urban regeneration, sustainability, and justice. It also provides a framework for teaching that is responsive to the realities of contemporary cities, where the distinctions between inside and outside, public and private, formal and informal are increasingly blurred.



Figure 1. Adaptation of a high-rise building for an inclusive ECD Montessori facility.

CONTEXTUAL GROUNDING: TEACHING IN THE POST-APARTHEID CITY

Johannesburg is an ideal, if deeply challenging, pedagogical laboratory for interior design education. As a city shaped by colonialism, apartheid, and neoliberal restructuring, it embodies extreme inequality, rapid spatial change, and highly contested public space. These conditions expose students to the lived realities of urban transformation in the Global South, where spatial injustice is not an abstract concept but an everyday experience. Informality, adaptive reuse, and hybrid public-private environments are not peripheral conditions but dominant modes of urban production.²⁰

Unlike cities where formal planning systems largely determine urban form, Johannesburg is continuously produced through negotiation, improvisation, and survival. Informal trading, backyard dwellings, and adaptive occupation of buildings form what Simone²¹ describes as *people as infrastructure*; social systems that compensate for inadequate formal provision. For interior design students, this context radically expands what counts as an interior. Interiors are not limited to enclosed rooms but include taxis, pavements, markets, and residual spaces that function as everyday civic rooms. Teaching within this context, therefore, demands pedagogies that are flexible, ethical, and attentive to lived practice rather than formal ideals.

The restructured Honours programme intentionally situates studios within these urban realities. Rather than working on hypothetical commercial briefs or neutral sites, students engage with contested spaces such as adaptive reuse buildings in Braamfontein, transport-adjacent public interiors, and heritage precincts under redevelopment pressure. These sites are selected not for their aesthetic potential alone, but for their socio-political density (as illustrated in Figure 2): they carry layered histories of displacement, resistance, and reinvention. In doing so, the studio becomes a space for grappling with urban complexity rather than escaping it.



Figure 2. Student adaptive reuse project for an old-age wellbeing centre in Krugersdorp, Johannesburg, illustrating interior design as a socially situated urban practice.

This approach is informed by scholarship that argues for urban learning *from within* rather than *about* the city. Robinson²² cautions against universalising urban theory from Northern contexts, advocating instead for situated urbanisms that emerge from local conditions. By embedding teaching in Johannesburg's everyday spaces, the programme aligns with this call, allowing students to generate knowledge from lived urban realities rather than imported precedents.

Importantly, students are not positioned as saviours or problem-solvers. Instead, they are trained to operate as careful observers, listeners, and translators. Before any design intervention is proposed, students undertake extended ethnographic observation, stakeholder mapping, and historical research.

This process foregrounds what Watson²³ terms *learning from informality*; recognising existing spatial intelligence, social networks, and material practices rather than imposing external solutions. It also aligns with De Boeck and Plissart's²⁴ argument that African cities must be understood through everyday practices rather than master plans.

Students are required to document not only physical conditions but also social rhythms, temporal patterns, and modes of appropriation. This often reveals sophisticated interior logics embedded in informal or marginalised environments: how shade is created, how privacy is negotiated, how commerce and domestic life overlap. These observations become the foundation for design decisions, ensuring that interventions are responsive rather than extractive.

Teaching in the post-apartheid city also requires confronting discomfort. Students encounter poverty, inequality, and spatial exclusion directly, often for the first time. Rather than shielding students from these realities, the pedagogy frames discomfort as a productive condition for ethical learning.²⁵ Studio discussions, therefore, explicitly address positionality, privilege, and responsibility, reinforcing the idea that design education is inseparable from civic formation.

Through this contextual grounding, interior urbanism emerges not as a stylistic agenda but as a situated pedagogy shaped by the realities of Johannesburg. The city becomes both content and method: a living classroom that teaches complexity, humility, and spatial responsibility. In this way, the post-apartheid urban condition is not merely a backdrop for education, but a critical teacher in its own right.

PEDAGOGICAL STRUCTURE: THE CITY AS STUDIO, THE INTERIOR AS METHOD

The Honours programme is structured around three integrated phases: reading the city, engaging the site, and designing interventions. These phases unfold across a full academic year and are intentionally iterative rather than linear, allowing students to move back and forth between analysis, reflection, and design. This structure reflects an understanding of learning as a situated, recursive process rather than a progression toward a fixed solution.

Reading the city

Students begin by mapping urban conditions using spatial analysis, archival research, policy review, and digital tools such as GIS overlays and AI-assisted pattern recognition. These technologies are introduced critically, enabling students to identify invisible systems: movement, exclusion, environmental stress, and informal economies, rather than merely producing aesthetic representations. For many students, this phase marks a fundamental shift: the city is no longer background context but an active interior system that can be read, interpreted, and designed.

In one studio cycle, students worked in Braamfontein, Johannesburg, focusing on underutilised edge conditions between residential areas and transport infrastructure. Through mapping exercises, students identified how thresholds, leftover spaces, and informal interiors (spaza shops, hair salons, prayer spaces) already functioned as civic rooms. This reframed their understanding of what counts as an interior and whose interiors matter.



Figure 3. Honours student posters exploring mobility and transport as urban interiors, demonstrating interior design engagement with movement and public infrastructure.

Engaging the site

Fieldwork forms the core of the programme and is deliberately slow. Students conduct repeated site visits, interviews, and participatory observations over several weeks, documenting how interiors are produced through everyday practices rather than formal design. This phase often produces discomfort, particularly for students accustomed to fast, form-driven studio culture. However, it is precisely this discomfort that becomes pedagogically productive.

Students are required to construct *site narratives* that combine spatial documentation, oral histories, and sensory mapping – as illustrated in Figure 4. These narratives are reviewed collectively in studio critiques, shifting assessment from individual genius to shared understanding. The process foregrounds what Lefebvre²⁶ describes as lived space, and positions students as listeners before they become designers.



Figure 4. Collection of construction-site models produced by students, illustrating iterative learning-through-making as a design research method.

Designing interventions

Design outcomes are deliberately modest in scale but ambitious in intent. Interventions typically take the form of adaptive reuse strategies, spatial frameworks, or programmatic insertions that support existing urban life rather than replace it – as illustrated in Figure 5, 6, and 7.



Figure 5. Revitalisation of a masjid to support community learning and empowerment.

For example, one student project proposed a multi-use interior framework along the edge of a disused warehouse in Braamfontein, accommodating informal traders during the day and community learning spaces in the evening. The project was assessed not on polish, but on ethical clarity, spatial logic, and responsiveness to real constraints.



Figure 6. Revitalisation of the Windybrow Theatre to support community use.

Assessment criteria are aligned with the pedagogy: students are evaluated on critical reasoning, contextual engagement, and disciplinary positioning, rather than solely on aesthetic resolution. This has required a conscious rethinking of marking rubrics and staff calibration, reinforcing pedagogy as an institutional project rather than an individual teaching preference.



Figure 7. Adaptive reuse of an industrial building as a furniture research and training hub.

TECHNOLOGY AS CRITICAL PEDAGOGICAL TOOL

While digital technologies are often introduced in design education as tools of efficiency or visual sophistication, this pedagogy reframes them as instruments of inquiry, ethics, and representation. AI-assisted site analysis, for example, is used to identify spatial patterns, densities, and movement flows that are not immediately visible during site visits. Students are trained to question the data itself; who is counted, who is invisible, and what biases are embedded in digital systems.

Immersive storytelling tools such as short films, audio mapping, and mixed-reality walkthroughs allow students to represent lived experiences that are often excluded from architectural drawings. These methods are particularly powerful in contested heritage sites, where multiple narratives coexist and conflict. By engaging these tools critically, students learn that technology does not replace empathy but can extend it.

Importantly, the programme explicitly addresses anxieties surrounding AI in creative disciplines. Rather than positioning AI as a threat to authorship, it is framed as a collaborator that must be ethically directed. This aligns with recent debates in design pedagogy that argue for technological literacy alongside critical judgment.²⁷ Technology, in this model, becomes a means of deepening engagement with the urban real rather than distancing students from it.

DISCUSSION: INTERIOR URBANISM AS DISCIPLINARY REPOSITIONING

Interior urbanism challenges the historical marginalisation of interior design within urban and architectural discourse, where it has often been positioned as secondary, decorative, or service-oriented. By teaching students to operate at the intersection of interior, urban, social, and political systems, this pedagogy repositions interior design as a form of *public practice* rather than a downstream professional service. This shift is not merely symbolic; it has direct implications for how students understand their disciplinary agency, ethical responsibilities, and future professional trajectories.

Graduates of this programme begin to imagine themselves not only as designers of enclosed spaces but also as contributors to urban regeneration, adaptive reuse, civic infrastructure, and policy dialogue. This aligns with broader calls to expand the agency of design disciplines in addressing complex societal challenges.²⁸ Interior urbanism, therefore, functions as a corrective to professional models that limit interior designers to late-stage decision-making, instead positioning them as early-stage thinkers capable of shaping urban agendas.

This repositioning is particularly important in contexts where urban development is dominated by architects, planners, and developers, often leaving interior designers excluded from strategic conversations. As Cuff²⁹ argues, spatial professions are increasingly required to work collaboratively across scales and disciplines. Interior urbanism equips students with the conceptual and methodological tools to participate in these collaborations with confidence and clarity, strengthening the visibility and legitimacy of interior design as an urban discipline.

The pedagogy is intentionally transferable. While the specific socio-political conditions of Johannesburg are unique, the underlying framework, situated learning, critical engagement, and interior thinking at urban scale, can be adapted to other cities facing inequality, rapid change, or contested space. This is especially relevant for design schools in the Global South, where informal urbanisation, adaptive reuse, and hybrid public-private spaces are common conditions rather than exceptions. As Roy³⁰ and Robinson³¹ argue, cities of the Global South demand new epistemologies of urban knowledge; interior urbanism offers one such epistemology from within the discipline of interior design.

Importantly, the framework is also applicable to marginalised or post-industrial contexts in the Global North, where issues of vacancy, exclusion, and socio-spatial repair increasingly dominate urban agendas. By foregrounding interiority as a lens for understanding urban life, this pedagogy provides a means of engaging with large-scale issues; such as sustainability, resilience, and social inclusion; through human-scale interventions. This echoes Pallasmaa's³² argument that meaningful spatial experience emerges through the body and the senses, even within vast urban systems.

The programme also demonstrates that interior design can address large-scale urban challenges without abandoning its disciplinary core. Attention to atmosphere, human experience, thresholds, and use becomes a powerful analytical and design lens through which sustainability and justice can be operationalised. Rather than competing with architecture or planning, interior urbanism complements these fields by focusing on how urban spaces are actually inhabited, adapted, and lived over time.³³

In this sense, interior urbanism operates simultaneously as pedagogy and disciplinary advocacy. It expands what interior design education can legitimately claim as its domain, while also equipping students with the intellectual and ethical tools to operate in complex urban environments. The pedagogy thus contributes not only to educational innovation, but to the ongoing redefinition of interior design as a discipline capable of shaping more inclusive, sustainable, and humane urban futures.

CONCLUSION: TEACHING FROM THE CITY-INSIDE-OUT

This paper has argued that interior design education must move beyond studio isolation toward a pedagogy embedded in the city. Through the case of the University of Johannesburg's Honours programme, it has shown how situated, critical, and technologically informed teaching can produce graduates who are ethically engaged, spatially literate, and urban in outlook.

Interior urbanism offers a framework for reimagining interior design education globally, particularly in contexts marked by inequality and transformation. By teaching from the city-inside-out, interior design becomes not only a discipline of rooms and buildings, but a practice of urban care, mediation, and repair.

As design education confronts accelerating urban crises and technological change, pedagogies that blur the boundaries between studio and city, theory and action, interior and urban will become increasingly necessary. Interior urbanism suggests that the future of interior design education lies not in retreating from complexity, but in embedding learning within it, where the city itself becomes the most demanding and most generous teacher.

NOTES

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MAKING THE MUNDANE VISIBLE: EXPERIENCING LIFE DIFFERENTLY

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INTRODUCTION

Within architectural and design education, accessibility is frequently positioned as a regulatory obligation, addressed late in the design process as a matter of compliance rather than inquiry. Such framing risks marginalizing accessibility as a technical addendum rather than recognizing it as a foundational pedagogical concern that shapes how designers understand space, bodies, and human experience.¹ In response to growing calls within pedagogy-focused design scholarship to foreground ethics, embodiment, and lived experience, this paper contends that accessibility functions most powerfully when taught as a way of thinking rather than a checklist of accommodations.²

Situated within the (dis)Ability Design Studio at the University of Illinois Urbana-Champaign, this research examines embodied empathy as a pedagogical practice through simulation-based learning. By engaging in Activities of Daily Living (ADLs) without sight, here understood as encompassing both blindness (complete loss of vision) and visual impairment (significant, varied reductions in visual acuity, field, or processing), we explore how sensory reorganization, spatial predictability, and multisensory feedback expose the assumptions embedded in everyday design decisions.³ Rather than positioning disability as deficit, the study frames blindness and visual impairment as alternative forms of intelligence, modes of spatial understanding that challenge visually dominant design paradigms.⁴

Aligned with AMPS pedagogical discourse, this paper frames experiential learning as a vital approach for cultivating critical awareness, ethical responsibility, and humility in design students. By engaging directly with the lived experiences of diverse bodies, students encounter the complexities of embodiment and accessibility firsthand, moving beyond abstract guidelines or technical checklists. Incorporating embodied empathy exercises encourages students to critically examine assumptions about ability, autonomy, and environmental interaction, challenging them to reconsider what constitutes effective and ethical design. In doing so, this approach provides a framework for evaluating design success that extends well beyond visual aesthetics, centering human experience as a measure of design quality. Ultimately, fostering these reflective practices equips students to approach design with greater sensitivity, inclusivity, and attentiveness to the ethical dimensions of their work.⁵

The (dis)Ability Design Studio

The (dis)Ability Design Studio, based in the Beckman Institute for Advanced Science and Technology, operates as both a teaching environment and a research laboratory dedicated to inclusive and participatory design. The studio brings together students, designers, healthcare professionals, and

community members to co-create design knowledge through lived experience, sensory exploration, and collaboration. This interdisciplinary structure reflects broader pedagogical shifts within design education that emphasize learning through participation rather than abstraction.

Central to the studio's pedagogical ethic is the principle of “designed by, not for.” This approach aligns with a participatory design scholarship that prioritizes collaboration with individuals who have experienced disability, challenging extractive or representational models of inclusion. Disability is understood not as a limitation but as a critical site of knowledge production, capable of revealing how environments afford or constrain autonomy, dignity, and agency.

Within this context, the studio positions embodiment and sensory awareness as legitimate modes of inquiry. Students are encouraged to interrogate normative assumptions about ability, efficiency, and success, using design education as a space for ethical reflection. This pedagogical framework directly informed the development and execution of the project examined in this paper. The studio is pictured in Figure 1.



Figure 1. Original founders Adam Bleakney, Deana McDonagh and Susan Sears (not pictured)

Lived Experience as a Driver for Pedagogical Inquiry

This project is grounded in the lived experience of growing up with two blind parents. Rather than serving as anecdotal motivation, this context functions as an epistemological foundation that shaped the research questions, methodology, and ethical stance of the study.⁶ Everyday encounters with inaccessible environments and adaptive practices inform our understanding of disability as relational, produced through design decisions rather than inherent bodily limitation.⁷

Within design pedagogy and disability studies, lived experience is increasingly recognized as a legitimate and necessary form of knowledge.⁸ In this project, lived expertise was not merely consulted but actively integrated throughout the research process.⁹ We co-designed the study with my parents, whose insights guided the selection of activities, ethical boundaries, and interpretive framing.¹⁰

Ethical considerations were central to this approach. Disability simulations have been widely critiqued for reinforcing narratives of incompetence, eliciting sympathy rather than empathy, and misrepresenting disabled expertise.¹¹ To address these concerns, the project explicitly rejected performance notions of blindness simulation. Instead, it was framed as an exploration of embodied empathy, learning rather than about individuals with visual impairments.¹² Lived experience thus functioned as both a pedagogical driver and an ethical safeguard.¹³

Methodological Framework: Embodied Empathy Through Simulation

The project is situated within scholarship on empathy-based learning, simulation in education, and inclusive design pedagogy.¹⁴ While simulations are often deployed to foster understanding, critics caution that they may oversimplify sensory difference or reproduce deficit-based narratives. Researchers Maher and Haegele, who study inclusive physical education and the experiences of individuals with disabilities, emphasize that simulations gain authenticity only when grounded in empathetic imaginings shaped by lived perspectives, rather than superficial role-play. Similarly, Silverman, whose work focuses on disability studies and the social construction of blindness, warns against approaches that frame blindness as loss rather than difference, highlighting the importance of recognizing diverse ways of perceiving and interacting with the world.

Guided by this scholarship, the study was structured around five non-negotiable principles: consultation with lived expertise; selection of universal Activities of Daily Living; commitment to full sensory immersion; ethical mindfulness; and prioritization of education over performance. These principles ensured that the simulation functioned as a pedagogical method rather than a representational exercise.¹⁵

Phase I involved a home-based simulation in which I completed five ADLs: brushing teeth, letting out my dog, making a bed, filling a cup of water, and preparing a meal. Tasks were completed once blindfolded and once with vision. Tasks were documented through reflective journaling, timing comparisons, and sensory observation. Time stamps can be seen in Figure 3. Analysis focused on sensory reorganization, cognitive load, and environmental interaction rather than task success or failure. Figures from the simulation can be referred to in Figure 2.



Figure 2. Phase I Simulation – Letting out a dog without sight

Activity of Daily Living	Time with vision	Time without vision
Brushing teeth	1 minute 24 seconds	2 minutes 20 seconds
Filling up a cup with water and ice	19 seconds	35 seconds
Preparing a meal	1 minute 37 seconds	2 minutes 54 seconds
Letting a dog outside	23 seconds	1 minute 35 seconds
Making a bed	1 minute 24 seconds	2 minutes 20 seconds

Figure 3. Phase 1 Simulation – Times of completed Activities of Daily Living with and without vision

In Phase II, the methodology was extended into an unfamiliar environment, requiring navigation and preparation of a multi-component meal from scratch in a new kitchen. By removing the advantage of spatial memory, this phase allows us to observe how adaptation unfolds when familiarity is stripped away: how new spatial relationships, textures, and sounds shape non-visual navigation, confidence, and independence. We also expanded the complexity of the tasks to better represent the full range of daily activities that people who are blind or visually impaired perform with skill every day. Reflecting on my own experiences and childhood memories of my mother, who effortlessly navigated cooking tasks despite being blind, it became clear that our Phase I simulation had simplified the depth of expertise, adaptability, and autonomy inherent in such activities. Phase II, by engaging with these challenges in a novel environment, provided richer insight into how to design mediates skills, independence, and confidence in everyday life.

EMBODIED FINDINGS: ACTIVITIES OF DAILY LIVING AND SENSORY REORGANIZATION

Across both phases, the removal of vision prompted sensory reorganization rather than diminished capability. Tactile, auditory, olfactory, and proprioceptive cues operate as integrated perceptual systems supporting navigation and task completion. Increased task duration reflected heightened cognitive engagement and environmental negotiation, signaling design complexity rather than reduced competence.

A significant finding concerned the distinction between functional success and visual aesthetics. Activities such as making a bed revealed that non-visual evaluations prioritized comfort, consistency, and usability over visual symmetry. This challenges dominant pedagogical values in design education that equate quality with appearance and suggests the need for alternative evaluative frameworks grounded in multisensory experience.¹⁶

Environmental predictability emerged as central to autonomy. Consistent layouts, tactile landmarks, and auditory feedback reduced cognitive load and increased confidence, while minor spatial disruptions introduced disproportionate barriers. These findings reinforce accessibility as a systemic quality produced through coherence and sensory continuity rather than isolated interventions.

Phase II: Unfamiliar Environments and Pedagogical Depth

Phase II intensified these insights by simulating the simulation within an unfamiliar environment. Without spatial memory, navigation depended entirely on sensory cues and deliberate pacing. This process revealed how quickly environments can become legible or exclusionary depending on their sensory affordances.

Inaccessible interfaces, particularly touchscreen appliances lacking tactile markers, emerged as critical pedagogical failures. The absence of non-visual feedback increased cognitive effort and required compensatory strategies such as mental timing and repeated checking. These encounters illustrate how contemporary design education often privileges visual interaction, marginalizing other sensory modes.

By foregrounding unfamiliarity, Phase II amplified learning outcomes, and ethical reflection. The experience demonstrates how pedagogical depth is increased when students are removed from familiar spatial contexts. We also note explicit implications for design education: integrating unfamiliar-space simulations can enhance student awareness of environmental affordances, cognitive load, and ethical design responsibility, fostering a more inclusive and human-centered pedagogy. Figure 4 showcases using sense of smell to deduct spices in order to cook a meal during Phase II of the simulation.



Figure 4. Olfactory perception is used to identify spices during a cooking task conducted in a simulated unfamiliar environment without visual input.

DRIVERS, LIMITATIONS, AND ETHICAL BOUNDARIES

This project is subject to limitations common to simulation-based research, including its temporary nature, single-participant scope, and use of controlled environments. The experience of short-term vision loss cannot replicate the depth of expertise developed through lived disability.

However, these constraints inform rather than undermine the pedagogical contribution. By emphasizing reflexivity, collaboration, and ethical framing, the study demonstrates how embodied methodologies can be responsibly integrated into design education. The findings reinforce the necessity of designing lived expertise and situating simulations within participatory pedagogical frameworks.

CONCLUSION

This paper has shown that accessibility functions most effectively when treated as a pedagogical practice rather than a mere technical requirement or compliance measure. By engaging students in embodied simulation grounded in lived expertise, design education can cultivate empathy that is not

only experiential but also critical and ethically informed. Such approaches resonate with the pedagogy of discomfort, in which learning arises through moments of uncertainty, sensory disruption, and reflective engagement, challenging students to confront assumptions about ability, perception, and autonomy.

Reframing accessibility as a creative foundation enables design pedagogy to challenge narrow definitions of ability and conventional markers of success, instead prioritizing dignity, agency, and sensory diversity. Embodied methodologies provide a structured yet flexible pathway for cultivating these values, demonstrating that inclusive design is not an afterthought but an integral part of the design process. Practically, design education can incorporate these insights by embedding embodied empathy exercises into curricula, fostering critical assessment of spatial affordances, and encouraging iterative reflection on ethical engagement with users and environments. Through such practices, students learn to recognize the ways in which design shapes human experience, ultimately producing work that is more thoughtful, inclusive, and responsive to the full spectrum of human diversity.

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First and foremost, I wish to express profound gratitude to my parents, whose lived experiences as blind individuals shaped both the foundation and the ethos of this research. They are pictured in Figure 5. Their insights guided every stage of this project—from the selection of Activities of Daily Living to the interpretation of each experience through the lens of design, capability, and awareness. More importantly, they continue to remind me that independence, creativity, and spatial understanding are determined not by sight but by perspective, adaptability, and resilience.



Figure 5. Parents of Dana Delaney: Kimberly Delaney, Michael Delaney

I am deeply grateful to Dr. Deana McDonagh, whose mentorship and empathy centred pedagogy transformed this work from a personal reflection into a structured academic inquiry grounded in design, embodiment, and human experience. Her guidance reinforced the belief that inclusive design begins with an understanding of lived experience, and that ethical and participatory approaches are central to responsible pedagogy.

Finally, I extend sincere thanks to Dr. Jeffery Moore for introducing me to the (dis)Ability Design Studio and facilitating this collaborative research. His support provided access to an environment that values empathy, innovation, and accessibility, allowing this project to explore design education as a space for ethical reflection and embodied learning.

NOTES

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COUNTER-URBAN SENSIBILITIES FOR THE HINTERLAND: TOWARD A PEDAGOGY OF REAL-WORLD RESEARCH- BY-DESIGN TEACHING

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INTRODUCTION

Urban Bias in Design Education

Design education has long privileged the urban. Across architectural pedagogy and professional practice, the city is repeatedly positioned as the primary site of complexity, innovation, and legitimate knowledge production. This privileging is embedded not only in studio briefs and site selections, but in the epistemological foundations of the discipline itself.

Over time, this urban orientation has become institutionalized. Design studio culture overwhelmingly focus on urban contexts, where governance structures are legible, datasets are abundant, and typologies are well established. These conditions normalize urban assumptions as pedagogical defaults.

This urban-default framework shapes how students learn to think and design. Many students become proficient in operating within urban logics—master planning, zoning, typological variation—yet remain ill-equipped to engage non-urban conditions where spatial questions are inseparable from livelihoods, ecological systems, informal governance, and long-term cultural practice (see Table 1). The issue, therefore, is not that non-urban territories are absent from architectural discourse, but that the forms of knowledge embedded within them are structurally under-recognized within design education. This reveals a pedagogical imbalance: certain sites, methods, and ways of knowing are privileged, while others are marginalised—not by intent, but by default.

	Student's Current Toolbox	Student's Missing Toolbox
Function & Typology	Library, Museum, Stadium, Civic Complex Urban Housing Blocks, Office Towers	Village Community Center Local Workshop / Market Vernacular Housing / Collective Spaces Agricultural Infrastructure
Design Method & Tools	Zoning, Plot Ratio, Master Planning BIM / CAD / Parametric Design Performance Simulation (Energy, Structure)	Fieldwork & Mapping Participatory Design Usage of Local Materials Topography Reading & Adaptive Use
Design Consideration	Regulation / Codes Function-Based Programming Top-down Planning	Sense of Belonging Local Memory Local Daily Life / Community Bottom-up Designing
Learning Mode	Studio Desk-Centered Representation-Based Learning (Drawings, Renders, Diagrams) Abstract Site Context Instructor-Centered Critique	Field Immersion & Observation Co-design with Locals Situated, Contextual Learning

Table 1. Students' Toolbox

Towards an Alternative

Addressing this imbalance requires architectural education to extend its attention beyond the city to the non-urban territories it has historically overlooked. Vast non-urban regions host substantial populations, sustain critical resource ecologies, and increasingly absorb the impacts of climate change and demographic transformation.¹ Many of today's most urgent challenges are therefore unfolding outside urban cores.

Recent scholarship has responded to this condition through a growing “non-urban turn,” challenging the assumption that architectural knowledge is inherently urban. However, this shift has not yet been fully internalized within design pedagogy, where non-urban context often remain exceptional case studies rather than foundational grounds of inquiry.

Within this broader context, the framework of *Hinterland Science* offers a conceptual alternative.² Rather than treating non-urban territories as passive extensions of cities or as spaces awaiting development, the hinterland is understood as an active and relational field—structurally vital yet systematically under-theorized. It foregrounds socio-ecological interdependencies, resource-based economies, and forms of spatial production that differ fundamentally from urban conditions. Crucially, this perspective reframes the hinterland not as an underdeveloped space, but as an under-privileged one in epistemic terms: a territory rich in knowledge that design education has not yet learned how to fully recognize or engage.

Building on this position, this paper proposes a *counter-urban pedagogy* as an educational response to persistent urban bias. By repositioning non-urban territories as central pedagogical grounds, counter-urban pedagogy seeks to rebalance what design education privileges, how knowledge is produced, and where architectural learning is situated. The following sections demonstrate how this pedagogical shift can be operationalized through real-world Research-by-Design Teaching, using ancestral roads as comparative territorial.

POSITIONING

Although non-urban territories have long appeared within architectural and planning discourse, they have rarely challenged the discipline's urban-default orientation. From early modernist visions—such as Wright's *Broadacre City* or Fourier's *Phalanstery*—to later theoretical and regional frameworks, rural space has largely been positioned as supplementary to the city.³ Even where non-urban territories were explicitly addressed, as in Wright's case, they were mostly not treated as autonomous spatial conditions but reconfigured according to urban logics. *Broadacre City* did not displace the primacy of the urban; rather, it dispersed and extended it, rendering the countryside legible through an urbanized model of settlement, governance, and infrastructure. In this sense, non-urban territories have been present in theory, yet subordinated in epistemic status.

More recently, an expanding body of research and practice has turned attention toward non-urban contexts. From critical regionalism⁴ and vernacular studies⁵ to Koolhaas's *Countryside, A Report*,⁶ these works demonstrate that architectural knowledge and intervention are not inherently urban. However, while such contributions have broadened the disciplinary imagination, they have not been embedded within design pedagogy. Non-urban territories continue to occupy a marginal position in architectural education, leaving students largely trained within urban assumptions and ill-equipped to operate beyond them.⁷

Pedagogical initiatives such as *Rural Studio*⁸ and *Rural Design*⁹ illustrate that alternative approaches are possible. Yet their continued treatment as exceptional models rather than structural norms underscores the need for a more systematic pedagogical framework—one that does not merely add non-urban cases to existing curricula, but recalibrates how architectural knowledge is produced, valued, and taught.

Crucially, the term counter-urban is not used here to denote opposition to the city or rejection of urban theory. Rather, it denotes a counterpoise: a movement that operates in the opposite direction in order to restore balance. Counter-urban pedagogy responds to the structural privileging of urban sites, methods, and knowledge forms by foregrounding those that have been comparatively under-recognized. It is therefore corrective rather than adversarial, relational rather than antagonistic.

Counter-Urban Pedagogy

In this paper, counter-urban pedagogy is proposed as an educational framework that counterbalances urban-default assumptions embedded in design education. Rather than positioning non-urban territories as peripheral or derivative, counter-urban pedagogy repositions them as primary grounds of inquiry—contexts in which architectural intelligence must be developed under conditions that differ fundamentally from urban norms.

These territories are approached not as simplified or deficient environments, but as active and complex socio-ecological systems shaped by local governance structures, livelihood-based economies, cultural practices, and long-term environmental processes. Counter-urban pedagogy therefore does not seek to replace urban knowledge, but to restore an imbalance, complementing it by cultivating capacities that are systematically underdeveloped in urban-centric studios.

By doing so, counter-urban pedagogy reconfigures how design is taught: from site selection and methodological framing to evaluation criteria and forms of evidence. It shifts emphasis from projection and control toward mediation, adaptation, and long-term spatial responsibility—capacities that become especially critical in non-urban and climate-sensitive contexts.

Three Pedagogical Shifts

Counter-urban pedagogy is articulated through three interrelated pedagogical shifts that recalibrate the relationship between site, knowledge production, and design action:

1. From urban bias to non-urban engagement.

Studios are situated in non-urban territories, where fragmented governance, livelihood-based economies, and ecological vulnerability disrupt standardized urban assumptions and require alternative design logics.

2. From critical distance to situated intelligence.

Rather than privileging analytical detachment, students develop situated intelligence through field immersion and sustained engagement with local actors, learning how design decisions emerge from lived social and ecological conditions.

3. From passive observation to digital co-sensing.

Digital tools are mobilized as complementary instruments alongside embodied experience, enabling layered readings in which data-driven insight and situated knowledge inform one another.

Together, these shifts cultivate design competence alongside the ability to navigate uncertainty, negotiate multiple knowledge forms, and engage non-urban territories on their own terms.

Methodology

To operationalize counter-urban pedagogy in design education, a methodological framework is required that can integrate knowledge production and design action within real-world contexts. Research-by-Design (RbD) provides such a foundation by treating design as a mode of inquiry in which knowledge is generated.¹⁰ Rooted in constructivist epistemology, particularly Schön's *reflection-in-action*¹¹ and later articulated as a distinct *designerly ways of knowing* by Cross,¹² RbD has been formalized as a methodology where the theoretical insight is generated through the design process itself.¹³

This paper extends this logic into architectural education by reconceptualizing the design studio as a knowledge-producing system, naming it as Research-by-Design Teaching (RbDT). Aligned with constructivist traditions such as the Bauhaus's *learning by making* and supported by pedagogical research framing design methodologies as learning strategies,¹⁴ RbDT positions the studio as a platform where design is used to generate knowledge, rather than solely to produce project outcomes. Methodologically, RbDT is organized as an iterative loop of preparation, field immersion, design iteration, dissemination, and reflection (see Figure 1), through which studio outputs are converted into shared knowledge that can cultivate subsequent cycles. Operating through expanded partnerships with local institutions such as government agencies, local schools, communities, and through multidisciplinary collaboration, students engage actual decision-making environments, where knowledge is negotiated across institutional, social, and disciplinary perspectives under real-world condition. In this sense, RbDT provides a methodological foundation that operationalizes counter-urban pedagogy by integrating situated intelligence with iterative, real-world knowledge production.

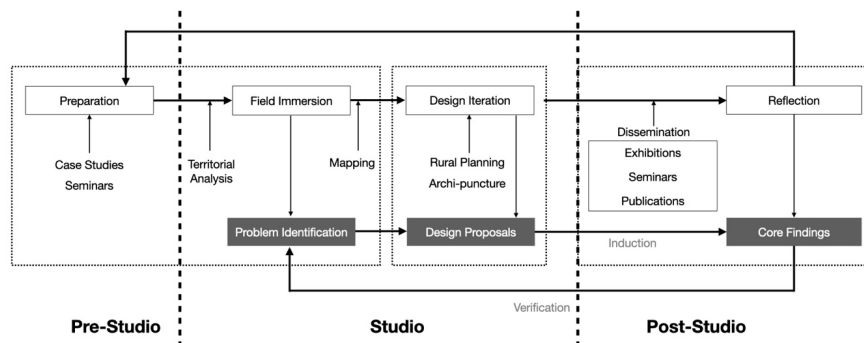


Figure 1. Structure of RbDT Framework

APPLICATION

Design Studios as Pedagogical Frameworks

Rather than functioning as conventional design studios, these courses were deliberately configured to cultivate counter-urban sensibilities through sustained real-world engagement. Across four studios conducted over two academic years, students encountered learning conditions—uncertainty, negotiated briefs, and incomplete data—that are largely absent from urban-default design education. These studios enacted the RbDT framework and its three pedagogical shifts not as a procedural workflow, but as a learning environment in which architectural knowledge was developed through situated engagement.

The studios brought together undergraduate and graduate students from diverse cultural and academic backgrounds to collaboratively investigate non-urban territories. This configuration produced distinct learning shifts rarely encountered in urban-default education, equipping students to operate within non-urban contexts where architectural agency is negotiated rather than prescribed (see Table 2). These learning conditions provided the foundation for the studio's engagement with ancestral road systems, introduced in the following section as a territorial framework particularly suited to counter-urban research-by-design teaching.

Phase	Studio Component	Pedagogical Intention	Learning Outcome / Skill Developed
Pre-studio	Case Studies	Establish non-urban reference frameworks beyond urban norms	Ability to contextualize design within non-urban precedents; challenge urban-default assumptions
	Seminars with Local Institutions	Situate design questions within real social, institutional, and environmental conditions	Understanding of governance structures, stakeholder perspectives, and contextual constraints
Studio	Territorial Analysis	Shift focus from isolated sites to territorial systems	Capacity for systematic thinking across temporal, spatial, and socio-economic dimensions
	Field Immersion	Cultivate situated intelligence through embodied experience and digital tools (GIS, POI etc.)	Ability to read landscapes, settlements, and everyday practices
	Mapping	Transform lived experience into shared and discussable evidence	Skill in Integrating qualitative observation with spatial and environmental data for collective reasoning
	Rural Planning	Formulate strategic responses at settlement and territorial scales	Ability to address challenges such as tourism pressure, depopulation, and ecological vulnerability
	Archi-puncture	Materialize strategies through targeted architectural interventions	Design of catalytic, site-specific projects embedded within broader territorial processes
Post-studio	Reflection	Convert studio outcomes into transferable knowledge through comparative synthesis	Capacity for critical reflection, enabling insights extend beyond individual projects
	Dissemination	Enable broader discussion and external testing of studio knowledge	Ability to communicate design knowledge to academic, professional, and local context

Table 2. Pedagogical Components and Learning Objectives of RbDT Studios

Ancestral Road Systems as Learning Territories

Ancestral roads across different regions of the world emerged as a particularly suitable and effective pedagogical medium for this learning shift. These historical, non-vehicular roads in hinterland territories, that once functioned as primary infrastructures connecting non-urban settlements, structuring economic exchange, social life, and territorial relations. With modernization and industrialization, many of those roads lost their original functions, while communities shaped by them experienced economic decline, demographic loss, and cultural disruption. Yet precisely because of this transformation, ancestral roads continue to register layered spatial, social, and temporal dynamics, making them productive sites for engaging continuity, uncertainty, and incremental change beyond object-based design problems.

The design task was therefore to explore how these ancestral roads, understood as a common territorial framework, might support new futures, serving as frameworks for locally grounded revitalization in non-urban contexts. Rather than relying on predefined programs or formal resolutions, students were required to negotiate design decisions across multiple scales and timeframes, responding to evolving relationships between infrastructure, settlement, landscape, and everyday life.

The global distribution of ancestral roads, together with their shared territorial logics, enabled the studios to operate as a global studio and adopt a comparative framework through which insights could be generated beyond single-site conditions. Within this ongoing framework, three representative ancestral roads were explored in the current phase: the Qhapaq Ñan in Peru, the Tea-Horse Road in China, and the Kumano Kodo in Japan.

Implementation as Embodied Learning

The studios trained students to construct their own analytical foundations. Through pre-studio preparation involving comparative case studies and seminars with local institutions, students learned to situate design questions within real social, environmental, and governance conditions rather than abstract site descriptions. Students engaged in field immersion to develop situated intelligence, integrating digital tools such as POI mapping, social media data mapping, and activity heat mapping (see Figure 2). This shift enabled students to move from relying on externally provided information toward actively assembling situated knowledge through observation, interpretation, and iterative reasoning.

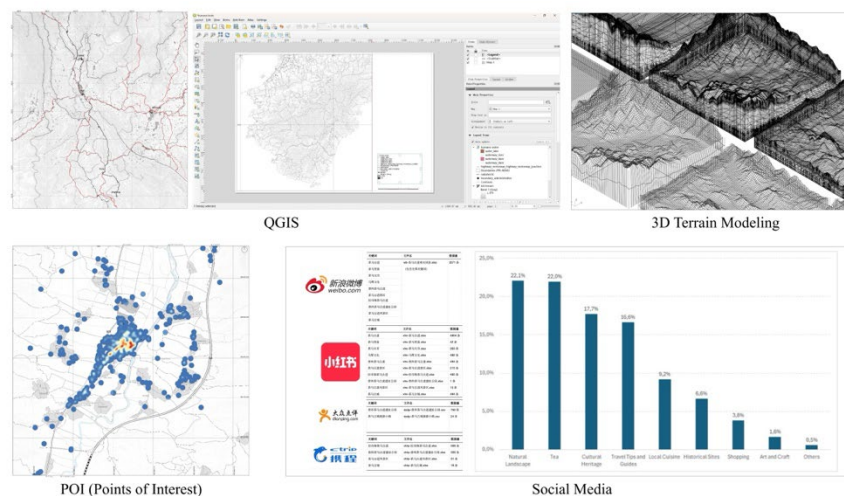


Figure 2. Digital co-sensing methods used in the Tea-Horse Road studio

In response to the limitations of plot-based architectural thinking inherited from urban education, students were required to operate across multiple spatial scales. Design work began at settlement and territorial levels before moving toward architectural intervention, enabling students to understand architecture as embedded within longer spatial, ecological, and socio-economic processes. Architectural proposals were therefore developed not as isolated objects, but as targeted interventions embedded within broader rural planning strategies, linking architectural decisions to incremental territorial transformation (see Figures 3–7).

Finally, to counter the isolation of design studios as self-contained academic exercises, the post-studio phase foregrounded reflection and dissemination as integral components of learning. Students

communicated their design outcomes with local actors, institutions, and communities, as well as with peers from diverse disciplinary and cultural backgrounds. Through comparative reflection and public dissemination, studio outputs were critically examined beyond individual authorship, allowing knowledge to circulate across different trail contexts and contributing to collective understanding. In this sense, the studio operated not merely as a site of individual design production, but as a platform for shared knowledge generation under real-world conditions.

Through this sequence, the studio translated counter-urban pedagogy from a theoretical position into an embodied learning experience, where architectural knowledge emerged through negotiation, interpretation, and iterative engagement with territory.



Figure 3. Community kitchen renovation in Taparaco along the Qhapaq Ñan, student project from the Spring 2024 design studio (Su Han)

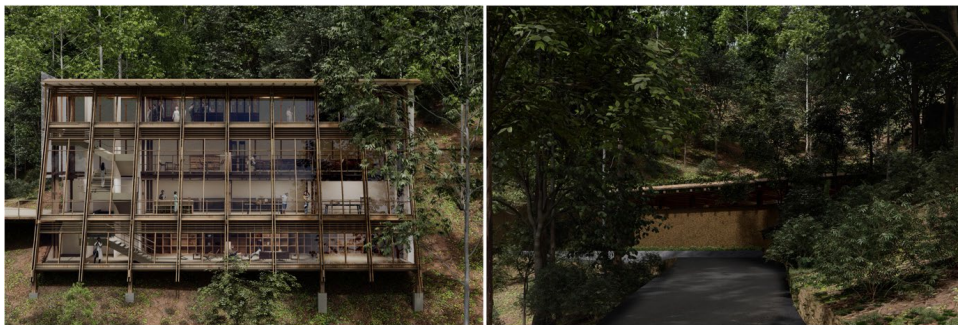


Figure 4. Yingke Pavilion & Mulberry Tea House along Tea-Horse Road, student project from Fall 2024 design studio (Julia Teng)



Figure 5. Tea Lounge along Tea-Horse Road, student project from Spring 2025 design studio (Wasin Hemachartwiroon)

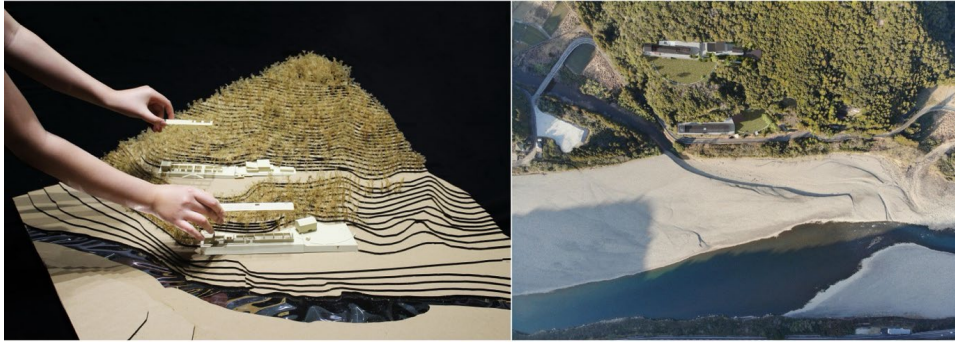


Figure 6. Nature and Spirit Center along Kumano Kodo, student project from Fall 2024 design studio (Karei O)

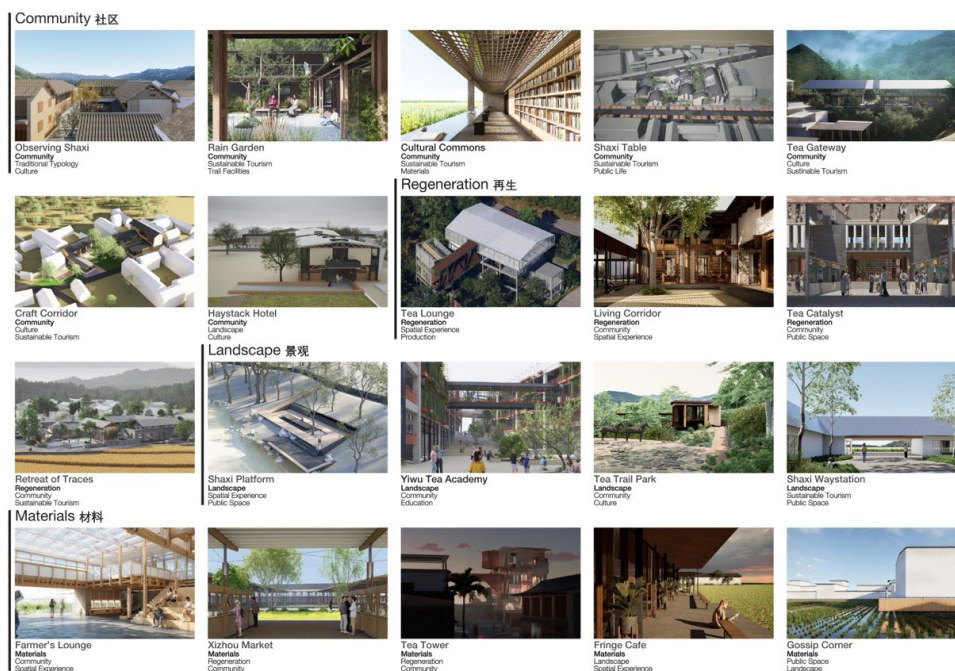


Figure 7. The results from Tea-Horse Road studio, Spring 2025

SYNTHESIS: FROM DESIGN STUDIO OUTCOMES TO COUNTER-URBAN SENSIBILITIES

Emerging Counter-Urban Sensibilities

Building on these studio outcomes, four recurring themes—Community, Landscape, Regeneration, and Material—are identified not as categorical outcomes, but as counter-urban sensibilities that emerged through design practice (see Table 3). These sensibilities represent ways of seeing, evaluating, and acting that differ fundamentally from urban-default architectural logic.

Rather than organizing design around form, efficiency, or growth, students learned to prioritize relational engagement (Community), ecological continuity (Landscape), adaptive reuse over replacement (Regeneration), and embodied knowledge embedded in local construction practices (Material). Together, these sensibilities reconfigure what architecture is for in hinterland contexts—not as a driver of expansion, but as a mediator of continuity, resilience, and care.

Across projects, *Community* reframed architecture's role from serving external consumption which often associated with tourism, to supporting everyday local life. Design attention shifted toward shared spaces, markets, agricultural facilities, and collective infrastructures that reinforce daily

routines and social connectivity. *Landscape* was no longer treated as a scenic backdrop, but as a human–land system shaped by long-term interaction. Students engaged agricultural patterns, water systems, terrain, and ecological processes as operative design conditions rather than visual context. *Regeneration* marked a shift away from new construction toward working with existing spatial and material conditions. Existing buildings, infrastructures, and trail segments were approached as repositories of memory, resources, and social potential, enabling adaptive transformation that links historical functions to contemporary needs. Finally, *Materials* foregrounded how knowledge is embodied in construction. Design choices moved away from standardized urban systems toward earth, timber, and hybrid vernacular techniques, understood as responses to local climate, resources, and production logics.

Theme	Core Question	Shift in Understanding	Design Focus	Architectural Positioning
Community	Who architecture is for	From "touristic destination" to "supporting local daily life"	Markets, shared spaces, farmland facilities	Architecture as support for daily practices and social continuity
Landscape	What architecture operates within	From "scenic background" to "human-land system"	Agricultural patterns, water systems, terrain	Architecture working within ecological and territorial logics
Regeneration	How transformation is approached	From "urban new construction" to "adaptive transformation"	Existing buildings, infrastructures, and trail segments	Architecture as reactivation existing spatial and social capacities
Materials	How local knowledge is embodied	From "standardized urban systems" to "local knowledge logic"	Earth, timber, vernacular techniques	Materials as carriers of place-based construction knowledge

Table 3. Four Themes of Counter-Urban Sensibility

Dissemination and Transferability

Within the Counter-Urban Research-by-Design Teaching framework (RbDT), dissemination activities extended pedagogical impact, by functioning as an integral phase of knowledge production. Exhibitions, seminars, and publications formed a critical stage within the pedagogical cycle, translating situated studio inquiry into shared, discussable, and transferable knowledge. Exhibitions functioned as public interfaces where patterns, contrasts, and recurring strategies across projects became legible through drawings, models, and videos, enabling comparative reading across sites and years. By requiring students to externalize and explain their design reasoning to non-academic audiences, these exhibitions introduced public accountability as a pedagogical condition rather than a representational afterthought. Seminars created discursive platforms where studio findings were tested, challenged, and reframed through dialogue with scholars, practitioners, and local actors. Operating both during and after the studio, these exchanges positioned critique, negotiation, and revision as integral components of architectural learning. Publications further stabilized these insights, enabling reflection beyond the immediacy of the studio and situating them within broader

disciplinary debates on non-urban design and pedagogy. Rather than functioning as documentation alone, publications serve to consolidate studio-generated knowledge into forms that could inform subsequent teaching cycles and comparative inquiry.

Through repeated application across multiple geographic and institutional contexts, this dissemination process demonstrates its transferability as a pedagogical model. Its value lies not in replicating specific design outcomes, but in providing a flexible framework through which counter-urban learning can be adapted to different territorial, cultural, and institutional conditions.

In this way, dissemination completes the pedagogical loop, transforming situated studio work into shared knowledge while reinforcing counter-urban pedagogy as a scalable and evolving educational practice.

CONCLUSION

This paper has argued that urban bias in design education is not simply a thematic imbalance but a structural privileging of urban sites and urban-compatible knowledge forms. Counter-urban pedagogy offers an alternative: it repositions non-urban territories as primary sites of inquiry and treats hinterland realities—ecological vulnerability, livelihood-based spatial production, fragmented governance, cultural continuity—not as peripheral complications but as central conditions for contemporary architectural competence.

Through four studios conducted along three ancestral roads, we demonstrates how *real-world Research-by-Design Teaching (RbDT)* can operationalize this pedagogical shift. Structured as an iterative loop—preparation, field immersion, design iteration, dissemination, and reflection—RbDT converts studio practice into a knowledge-producing system in which students learn not only to design, but to negotiate uncertainty, translate situated experience into shareable evidence, and work across multiple knowledge registers. In this sense, the studio becomes more than a simulation: it becomes a platform where design knowledge is co-produced with territories, institutions, and communities under real-world conditions.

Across contexts, a consistent framework supported comparative learning without standardizing outcomes. Students developed counter-urban sensibilities—capacities for contextual reading, multi-scalar reasoning, stakeholder negotiation, and the careful use of digital co-sensing tools as complements to embodied fieldwork rather than substitutes for it. This combination is crucial in hinterland settings, where conventional datasets and “urban-ready” analytical methods often fail to register lived spatial realities.

Looking forward, counter-urban pedagogy—implemented through RbDT—offers a scalable model that can extend to other hinterland contexts and other territorial infrastructures beyond ancestral roads. Its significance is not that it adds “rural” content to an otherwise unchanged curriculum, but that it reconfigures the discipline’s educational defaults: where knowledge is produced, what forms of evidence are valued, and how design action is situated relative to urgent territorial realities. In doing so, it supports a longer-term repositioning of the academy: not as an ivory tower delivering urban templates outward, but as a field station embedded in the contested spaces where resilience, continuity, and transformation must be designed with care.

NOTES

- ¹ Martijn De Geus, "Proposal for a Science of the Hinterland," *Urban Design*, no. 4 (2024): 6–27.
- ² De Geus, *Proposal for a Science*.
- ³ Neil Brenner and Christian Schmid, "Towards a New Epistemology of the Urban?," *City* 19, nos. 2–3 (May 2015): 151–82, <https://doi.org/10.1080/13604813.2015.1014712>.
- ⁴ Kenneth Frampton, *Modern Architecture: A Critical History* (Oxford University Press, 1980).
- ⁵ Nan Yang et al., "A Theoretical Design Framework of Contemporary Vernacular Architecture Based on a Scoping Review of the Best Practices Worldwide," *Buildings* 14, no. 11 (November 2024), <https://doi.org/10.3390/buildings14113525>.
- ⁶ AMO and Rem Koolhaas, *Countryside A Report* (GUGGENHEIM / TASCHEN, 2020).
- ⁷ Cole Roskam, "Inventing the Rural: A Brief History of Modern Architecture in the Countryside," *Architectural Design* 86, no. 4 (2016): 14–19, <https://doi.org/10.1002/ad.2062>.
- ⁸ David Hinson and John Gaber, "Experiencing the Rural Studio: An Assessment of Student Learning Outcomes," *94th ACSA Annual Meeting*, 2006.
- ⁹ Dewey Thorbeck, *Rural Design: A New Design Discipline* (London: Routledge, 2013), <https://doi.org/10.4324/9780203162545>.
- ¹⁰ Rob Roggema, "Research by Design: Proposition for a Methodological Approach," *Urban Science* 1, no. 1 (September 2016): 2, <https://doi.org/10.3390/urbansci1010002>.
- ¹¹ Donald A. Schön, *The Reflective Practitioner : How Professionals Think in Action* (Basic Books, 1984).
- ¹² Nigel Cross, "Designerly Ways of Knowing," *Design Studies* 3, no. 4 (1982): 221–27.
- ¹³ Johan Verbeke, "This Is Research by Design," in *Design Research in Architecture* (Routledge, 2015).
- ¹⁴ Terrence Curry, "A Theoretical Basis for Recommending the Use of Design Methodologies as Teaching Strategies in the Design Studio," *Design Studies* 35 (November 2014), <https://doi.org/10.1016/j.destud.2014.04.003>.

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FROM LEARNERS TO LEADERS: EMPOWERING STUDENT AGENCY THROUGH A LEARNER-LED, VERTICALLY-INTEGRATED LA STUDIO ELECTIVE

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INTRODUCTION

Design education is increasingly tasked with preparing students not only to produce technically competent work but also to operate as adaptive, collaborative, and self-directed professionals in complex real-world contexts. Contemporary practice requires designers to navigate ambiguity,¹ communicate across stakeholder groups, make decisions with incomplete information, and assume leadership roles within interdisciplinary teams. As social, environmental, and economic pressures reshape the profession, educators face the challenge of designing learning environments and experiences where students can practice these capacities before graduation.

Traditional studio pedagogy, while foundational, often retains hierarchical structures that limit student agency. In many studios, instructors define project scope, guide decision-making, and evaluate outcomes against predetermined criteria. Although this approach supports technical rigor, it can constrain opportunities for students to exercise autonomy, take ownership of learning, and develop professional judgment. Research suggests that overly prescriptive studio structures may reduce students' engagement in self-directed problem solving and collaborative decision-making – capacities essential to professional practice.²

In response, design educators have increasingly adopted learner-centered and experiential pedagogies that emphasize agency, collaboration, and real-world engagement. Within this shift, learner agency – students' capacity to direct their learning, make purposeful decisions, and act effectively within authentic contexts – has emerged as a critical construct for leadership development.³ However, while agency is widely valued in theory, fewer studies document *how* it is cultivated within design studios, particularly in settings where instructor authority and critique traditions are deeply ingrained.

This paper contributes practice-based evidence through a case study of a learner-led, vertically integrated landscape architecture studio situated within an immersive learning framework. The course intentionally departs from instructor-driven models by positioning students as primary decision-makers responsible for defining goals, managing workflows, engaging community partners, and producing design proposals. The instructor functions as facilitator and mentor, supporting students through reflection and iterative critique while resisting the impulse to determine outcomes.

The study examines how student agency manifested within this environment and how leadership emerged through collaboration and accountability. As one student reflected in a pre-course survey, “I want to get better at leading a group of people through thinking and ideating,”⁴ highlighting a desire

for leadership development that extends beyond technical skill acquisition. Using multiple data sources gathered across a semester, the study analyzes how students navigated decision-making, engaged uncertainty, and assumed leadership roles. The findings suggest that when agency is intentionally scaffolded – rather than simply granted – students demonstrate increased confidence, adaptability, and professional readiness. By documenting this course structure, this paper offers a replicable model for integrating agency-centered pedagogy into design studios.

SUPPORTING LITERATURE

Learner-centered and learner-driven pedagogies

Learner-centered pedagogy emphasizes autonomy, reflection, and the meaningful application of knowledge in real-world contexts.⁵ Compared with instructor-centered models, learner-centered approaches distribute responsibility for learning, encourage metacognitive skill development, and position students as active participants in constructing knowledge.⁶ Extending this idea, learner-driven education positions students as co-creators of the learning process. Herranen et al. argue that learner-driven environments require students to shape not only outcomes but also the learning process itself.⁷ Research shows that learner-centered approaches enhance student engagement and result in deeper conceptual understanding, particularly when the learning environments support risk-taking and iteration.⁸ Autonomy alone, however, does not ensure learning; without clear expectations and support, learner freedom can become confusion or uneven participation.⁹ This balance between structure and autonomy is especially relevant in studio pedagogy, where critique cultures and deadlines can unintentionally reinforce instructor control.

Student agency and leadership development

Student agency is central to research on motivation, self-directed learning, and leadership. Saarela et al. describe agency as the capacity to intentionally influence one's learning through goal-setting, decision-making, and strategic action.¹⁰ Agency is shaped by opportunities to act, access to resources, and instructional conditions. When students make decisions, coordinate efforts with others, and adapt to changing constraints, they practice competencies commonly associated with leadership, including coordination, initiative, accountability, and adaptive problem solving.

Iversen et al. argue that leadership often emerges when educators “let go of control” in ways that invite students to take responsibility for navigating complex learning situations.¹¹ Sheridan et al. similarly emphasize a balance of structure and freedom: agency develops when instructors provide clear expectations and timely support while allowing students autonomy in process and execution.¹² In studio contexts – where problems are open-ended and iterative – agency is particularly relevant, but it may be constrained by rigid briefs, fixed deliverables, and instructor-centered critique structures.

Experiential and immersive learning in design education

Experiential learning provides a foundation for understanding agency and leadership development in applied education. Kolb's experiential cycle highlights the interplay of concrete experience, reflection, conceptualization, and experimentation.¹³ Immersive learning models extend this framework by situating students in sustained, authentic contexts where learning is shaped by real constraints and stakeholder relationships. High-impact practices such as community-engaged and project-based learning have been linked to higher engagement, persistence, and professional readiness.¹⁴ In design education, immersive studios can expose students to the social and logistical complexities of practice.

Immersive learning also introduces challenges: increased cognitive load, uncertainty, and uneven participation can undermine learning if not intentionally scaffolded. This literature points to the need

for studies that document *how* agency is cultivated in immersive studio environments and *how* leadership emerges through that process. The present study addresses this need in a vertically integrated, learner-led landscape architecture studio elective.

COURSE CONTEXT AND PEDAGOGICAL FRAMEWORK

The course examined in this study, “LA in the Community,” is a learner-led, vertically integrated landscape architecture studio offered “by permission” to third through fifth year and graduate students as an elective within Ball State University’s Department of Landscape Architecture. The unique course structure is advertised when all elective course options become available to students before registration. Students “apply” to get in the course by supplying a written statement expressing what they hope to gain personally and professionally by taking the course. They also submit a cut sheet of their “best, most proud of” projects. Enrollment typically includes students from multiple academic levels, which mirrors professional practice environments where teams include members with varying experience. The course meets weekly for extended sessions and includes additional meetings with community stakeholders outside scheduled class time.

Unlike traditional studios, the course does not begin with a fixed brief or instructor-defined outcome. Students collaborate with a community partner to identify needs, define scope, and determine deliverables. This structure shifts responsibility for both process and outcomes toward students. The instructor’s role is deliberately reframed from expert authority to facilitator and coach: setting expectations, supporting reflection, and providing critique while resisting directive control of design decisions.

A defining feature of the course is a course contract co-created early in the semester. Students collaboratively establish expectations for professionalism, workload distribution, communication, and conflict resolution. The contract serves as a shared reference point when challenges arise and functions as an accountability mechanism that supports learner agency. Pedagogically, it reinforces that agency is not individual freedom alone but collective responsibility within a team.

Agency is scaffolded through recurring reflective practices, iterative checkpoints, and structures that encourage students to use resources effectively. Across the semester, students must (1) make decisions about direction and priorities; (2) identify learning needs and seek resources; (3) connect work to real community needs; (4) leverage feedback from peers and stakeholders; and (5) collaborate through distributed leadership. Assessment emphasizes process and growth alongside the quality and clarity of deliverables.

METHODS

Research design and questions

This study employs a qualitative case study methodology to examine how student agency and leadership emerged within a learner-led immersive studio. The study was guided by three research questions: (1) How does a learner-led studio structure support the development of student agency? (2) In what ways do students demonstrate leadership within an immersive, community-engaged design course? (3) How do students perceive growth in confidence, responsibility, and professional readiness across the semester?

Participants and setting

Participants included nine students enrolled in the course. Enrollment was elective; this self-selection likely influenced motivation and willingness to engage with autonomy. Students worked with a community partner on a semester-long design project requiring site analysis, stakeholder engagement, concept development, and final communication.

Data sources

Multiple data sources were used to capture student experience. Pre- and post-course surveys assessed perceptions of collaboration, decision-making, leadership, and comfort with ambiguity using Likert items and open-ended prompts. Reflective self and peer reviews, documented decision-making processes, group dynamics, uncertainty, leadership moments, and shifts in confidence. These peer and self-evaluations captured students' perceptions of contribution, communication effectiveness, and accountability; instructor observations documented group interactions and leadership moments; and final project artifacts provided evidence of professional communication and iteration over time.

Analysis and trustworthiness

Data were analyzed using thematic analysis to identify recurring patterns related to agency and leadership. Triangulation across surveys, reflections, peer evaluations, observations, and artifacts strengthened credibility.

Limitations include the small sample size and self-selection into the course, which constrain generalizability. The study aims for context-rich explanation rather than statistical inference, offering transferable insights for educators designing agency-centered studios.

FINDINGS

Analysis revealed consistent patterns across surveys, reflections, peer evaluations, observations, and artifacts. Students reported growth in confidence and leadership capacity, and evidence of agency was visible in how students made decisions, collaborated, and adapted to uncertainty. Findings are organized into five themes.

Agency through decision-making

Students exercised agency through repeated, consequential decision-making. Because project parameters were not predetermined, students shaped scope, direction, and priorities. Pre-course survey responses indicated uncertainty about leading and making independent decisions, with several students describing prior studios as instructor-driven. One student wrote, "In past studios, I usually waited to be told what to do next. This class feels different – it's the first time I've really had to decide what direction to take on my own."¹⁵

As the semester progressed, reflective journals documented a shift from hesitation to ownership. Students increasingly articulated rationales for choices, negotiated trade-offs, and defended decisions during group discussions and stakeholder meetings. Decision-making became shared rather than centralized: students developed routines for proposing options, testing ideas through sketches and precedent review, and revising based on feedback. This pattern suggests that agency developed through repetition and consequence. Students learned that leadership involves accountability – making decisions, justifying them, and adapting them when conditions change.

Leadership as responsibility rather than position

Leadership emerged organically rather than through assigned roles. No leadership titles were designated; instead, leadership surfaced as students responded to project needs and group dynamics. Peer evaluations highlighted leadership behaviors such as initiating conversations with community partners, organizing meetings and deadlines, synthesizing feedback, and supporting teammates during uncertainty. One peer reflection noted, "Ethan is very involved in every aspect of the project and doesn't hesitate to step in when something needs to be done. He leads by doing, not by telling people what to do."¹⁶

These observations indicate a shift from hierarchical conceptions of leadership toward collaborative responsibility. Leadership was fluid and context-dependent. Students led through facilitation, technical expertise, communication, reliability, and the ability to connect details of the project to larger goals.

Adaptability and productive engagement with ambiguity

The course's intentional ambiguity initially produced discomfort. Early reflections captured anxiety about not knowing what the final product was "supposed" to be. One student wrote, "At first, it was uncomfortable not knowing exactly what the final product was supposed to be."¹⁷ Over time, students reframed ambiguity as intrinsic to design practice. Post-course reflections frequently referenced increased confidence: "I learned that it's okay not to have everything figured out right away. The process is about responding and adapting."¹⁸



Figure 1. Adaptability in engagement with community stakeholders.

Adaptability was especially visible during stakeholder interactions, where priorities and constraints evolved. Students reassessed assumptions, revised proposals, and negotiated trade-offs between aspiration and feasibility. Rather than treating change as failure, students increasingly treated it as information. One student reported, "Engaging with community stakeholders allowed us to design with empathy — our process changed every time we heard from them."¹⁹ The ability to stay flexible, iterate, and respond constructively emerged as a core indicator of leadership growth, particularly as students linked design choices to constraints and community priorities.

Collaboration as a leadership practice

Collaboration was both a requirement and a mechanism through which leadership developed. Students negotiated roles, balanced workloads, and integrated different perspectives. Mid-semester self and peer reviews described challenges including misaligned expectations, different work rhythms, and disagreements about design direction. Over time, students developed strategies for communication and collective decision-making. One student wrote, "I think my collaboration skills have definitely improved. I now understand how to manage different perspectives and still move the project forward."²⁰ Another student reported, "I feel that I've grown a ton from the first class to now. I came in unsure and intimidated but now feel way more confident in collaborative settings."²¹

Peer evaluations emphasized listening, follow-through, and clarity as valued leadership behaviors. Collaboration extended beyond the classroom: students presented to community stakeholders, received feedback, and revised accordingly. These experiences required students to translate design

thinking into accessible language, reinforcing empathy and communication as components of professional leadership.



Figure 1. Collaboration as a leadership practice.

Evidence of professional readiness and external validation

Student self-assessments suggested increased readiness to lead professional processes. Post-course surveys reported greater comfort leading discussions, managing group dynamics, communicating with non-design stakeholders, and navigating open-ended projects. One student summarized, “I appreciated the student-led structure of this class. It helped me realize that I don’t always need to wait for instructions to lead a process.”²²

Final artifacts demonstrated professional quality in organization, clarity of communication, and responsiveness to stakeholder input. The project also received external recognition with an Indiana State Chapter of the American Society of Landscape Architects award for community collaboration. The work was also incorporated into municipal planning documentation, providing corroborating evidence that students translated agency into credible professional proposals.

DISCUSSION

This study provides practice-based evidence that learner-led immersive studios can cultivate leadership through agency. Leadership emerged not as a discrete skill taught through instruction but as an outcome of participation in authentic, consequential work. The findings align with scholarship arguing that agency develops when learners are empowered to act intentionally within meaningful environments²³ and when instructors provide guidance without controlling outcomes.²⁴

Agency as a catalyst for leadership development

A central contribution of this study is demonstrating how agency can be operationalized as a set of learnable practices: decision-making, self-directed learning, purposeful action, strategic use of resources, and collaboration. Students practiced leadership by making and defending decisions, coordinating tasks, and adapting to constraints. In this sense, agency functioned as the mechanism that translated pedagogical design into leadership development.

Agency did not equate to unbounded freedom. Students experienced autonomy within a curated structure – contract-setting, reflective routines, and iterative checkpoints – that reduced the risk that ambiguity would become paralysis. This supports the argument that agency is scaffolded rather than simply granted.

Distributed leadership and the role of vertical integration

The findings support distributed models of leadership.²⁵ Leadership moved among students depending on project needs and expertise. Vertical integration likely reinforced this distribution by creating peer mentorship dynamics: more experienced students modeled professional behaviors, while less experienced students contributed meaningfully and grew into responsibility. For design educators, mixed-level studios may foster leadership development by normalizing mentorship and distributed responsibility according to skillsets and varied academic, professional, and life experiences.

Ambiguity as a productive condition for learning

Ambiguity played a productive role in learning. Students developed tolerance for uncertainty – an attribute closely tied to professional judgment – and learned to treat change as part of design rather than a hindrance. This finding suggests that ambiguity should not always be minimized. When paired with supportive scaffolding, ambiguity can prompt adaptability, reflection, and initiative.

Implications for design pedagogy and instruction

The study suggests several practical implications. First, leadership development can be integrated into studio pedagogy by giving students authentic control over scope, process, and stakeholder engagement. Second, culture-setting mechanisms (such as course contracts and shared norms) can support accountability and reduce the likelihood that distributed responsibility becomes diffuse responsibility. Third, instructors should practice guided restraint: providing feedback, structure, reflection, and invitations to choose a path forward while also resisting the impulse to solve the problem for students.

Limitations and future research

The study is limited by sample size and self-selection. Students who opted into the course may have been more motivated or open to autonomy-oriented learning. The instructor's dual role may also shape interpretation. Future research should replicate this model across cohorts, incorporate longitudinal tracking into internships and early practice, and compare learner-led studios with more traditional studios using mixed methods. Future work should also examine how agency-centered studios support students who enter with lower confidence or less prior leadership experience.

CONCLUSION

This case study indicates that learner-led immersive studios can cultivate leadership by creating conditions where agency is necessary and supported. Students developed confidence, adaptability, and professional readiness by engaging in consequential decision-making, collaborating across teams, and navigating stakeholder relationships. Leadership emerged as practice – organizing work, communicating across perspectives, and responding to uncertainty – rather than as a title or personality trait.

For design educators, the findings suggest that agency can be treated as an instructional goal and designed into studio structures through authentic responsibility, early culture-setting, reflective practice, and iterative feedback. Immersive community-engaged projects provide real-world relevance, while facilitative instruction provides scaffolding that helps autonomy translate into learning. Vertically integrated enrollment can further support distributed leadership and peer mentorship.

Overall, the study supports a straightforward but consequential claim: students learn to lead when they are given meaningful opportunities – and responsibility – to lead.

NOTES

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- ² Kimberly M. Sheridan et al. "Strategic Shifts: How Studio Teachers Use Direction and Support to Build Learner Agency in the Figured World of Visual Art," *Journal of the Learning Sciences* 31, no. 1 (2022): 14–42, <https://doi.org/10.1080/10508406.2021.1999817>
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- ¹² Kimberly M. Sheridan et al. "Strategic Shifts: How Studio Teachers Use Direction and Support to Build Learner Agency in the Figured World of Visual Art," *Journal of the Learning Sciences* 31, no. 1 (2022): 14–42, <https://doi.org/10.1080/10508406.2021.1999817>
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AI IN THE COASTAL LANDSCAPE: URBAN AND ENVIRONMENTAL DESIGN THROUGH NEW TECHNOLOGIES

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INTRODUCTION

Hampton University's Department of Architecture offers a Certificate in Adaptation to Sea Level Rise as part of its 5-year Master's degree (M.ARCH) program. During a year-long seminar series, Hampton architecture students collaborate with engineering students from nearby Old Dominion University to create design solutions for flooding in communities in the Hampton Roads region. This partnership is called the Coastal Community Design Collaborative (CCDC) and has existed for more than a decade, and as new technologies emerge in the design space, it has become increasingly important for this pedagogy of interdisciplinary collaboration to evolve with the tools available. This paper lays out the framework by which the course series introduced text-to-image artificial intelligence models (GenAI) software to the classroom. The goal of this introduction was to facilitate better comprehension of architectural technologies and landscape techniques meant to combat nuisance flooding in low-lying communities. This paper outlines several assignments that were given to familiarize the students with the power of the GenAI tool but also to highlight its clear and specific limitations. The paper leverages created by the teaching team to gain a basic understanding of the bias of the selected text-to-image model, OpenArt.ai, and later a broader variety of tools. Issues of equity, justice, and contextual accuracy underpin the choices made within these artificial intelligence (AI) tools, raising the potential for future conversations about the role of GenAI in design and society. Further experimentation will become necessary to maximize the positive impact in the classroom as regards the pedagogy of technologies and skills associated with equitable adaptation to sea level rise.

Forty Years of Artificial Intelligence

In 1985, an article in the *Journal of Reading* opined that ‘the most frequent response of teachers to microcomputer software has been disappointment... Computers are not currently capable of carrying out the kinds of instruction that most teachers want.’¹ Today, debate remains whether computerized AI in society and education has surpassed this point, even as AI models and technologies push the limits of conceivable computer applications. Harold Cohen’s AARON, an experimental AI model of the late 20th century, might be able to draw flowers and figures in garden settings,² but even at that nascent time, it had already been identified that ‘AI ha[d] evolved into a search for the principles, perhaps the laws, of intelligent behavior in general, whether exhibited by a human or a computer.’³ At

the time, Cohen wrote, ‘I rarely seen any computer art that [wasn’t] simple-minded and boring.’⁴ Rather than seeing GenAI as the means of completing or expediting a task, such as making visual art, AARON provided ‘a program designed to investigate the cognitive principles underlying visual representation.’⁵ Thus, around forty years before present debates about the role and utility of AI, programs were provoking crucial dialogues about computers, art, and perception: dialogues which can be productively continued in the study of AI, and particularly ethical AI, in modern pedagogy.

Today’s debate can be rooted in the potential for AI to affect meaningful work, effects which cascade into other aspects of modern life such as ‘human wellbeing and flourishing.’⁶ One might also construe this to include schoolwork and the parts and parcels of collegiate education, which includes ‘*skill cultivation and use*’ as a component of meaningful work.⁷ Further literature is devoted to the creation and stewardship of ethical AI, meant to protect consumers and society as a whole: these almost utopian prayers for a new and untested technology hark back with some unease to the early days of AI, and what it meant to users at the time.⁸ The mix of theories of human intelligence, ethics, utility, and meaning has the potential to create theoretical hurdles which inhibit its day-to-day implementation. This paper therefore turns to the educational application of text-to-image generative AI (GenAI) in hopes of escaping the bind of computer applications which are ill-suited to their purposes in the classroom and beyond.

Research has begun to parse the interactions between students and AI tools in the classroom. Among the findings, it has been shown that ‘training in prompting skills and effective use of AI significantly effected students’ interactions with AI... highlighting how AI can enhance teaching practice.’⁹ In addition, the potential for ‘delivering instant and detailed feedback, and customizing instructional content’ positions AI systems well for providing tutoring and supplemental teaching functions.¹⁰ Still, the importance of teaching ethics in experimentation, development, and regular everyday use of AI appears to remain a lacuna within contemporary social practice with the tools.¹¹ Attempts to tie AI ethics to medical ethics may not be wholly successful;¹² AI fairness and the prevention of systemic bias stand as critical goals for the education field as its implementation sediments as a given norm across society.¹³ All these issues and more present an opportunity not only to teach the skills necessary to effectively leverage AI to create designs, write memos, and solve problems – as with many classroom settings – but also to retain a critical eye on the tools and prevent absorption into an environment marked by misinformation and confusion. Working with students before they enter the workforce can help increase awareness of the mistakes and limitations of AI. In the field of architectural education, where automated functions like AI remain relatively low-impact in the studio and seminar environments, the need for AI education is even more important as a means of technologically competing with hard sciences and even potentially other universities further along in the process of harnessing AI, and GenAI in particular.

Methods in AI Pedagogy Development in the Architecture Seminar Environment

This study emerged from the implementation of assignments related to GenAI in two separate architecture electives within the Hampton University 5-Year Master’s of Architecture accredited program. The purpose of the assignments was to pedagogically develop a method of explaining and demonstrating concepts relating to landscape urbanism and adaptation to sea level rise, the foci of this seminar series. Various GenAI software versions were specified across two semesters in two separate academic years in 2025. Changes in the GenAI assignment prompts between the two semesters largely occurred out of an increased awareness of the other tools available to the course members. Rather than eschewing GenAI, these assignments embraced the unknown assets and defects of the technology, in order to raise the awareness of both students and instructors around AI visualizations in the architecture classroom.

GENAI AS TEACHING TOOL IN THE FIELD OF LANDSCAPE URBANISM

Hampton University's ARC 531-532 Adaptation to Sea Level Rise seminars delve deep into the science and technology of responses to a changing local environment.

Text-to-image GenAI was first implemented in the Spring 2025 teaching term for this sea level rise seminar series. The purpose of the assignment was to allow the students to experiment with different green infrastructure keywords and to see the various combinations of technologies in real time. As the AI portals feed back changing images with each different prompt, the students were able to gain and experience greater agency of the learning process as they chose their own outcomes. The prompt for this first inroad to GenAI instruction can be found below.

"Hello students,

Please stand by for a larger announcement about the course, but I wanted to give you your homework for Tuesday.

1. Please get a free account on OpenArt.ai.

2. Create a prompt using the first words list if you are on the streets team, and the second words list if you are on the shorelines team. The point is to use a composition of 3-5 terms in a series as a prompt to generate a coherent, sensible image of green infrastructure, flooding, and/or the urban landscape. For example, 'a church between two ditches behind a street with four trees.'

Streets team words list: gutter, storm drain, ditch, swale, church, street, garden, trees, houses, pond, graveyard, plants, bushes, flood.

Shorelines team list: living shoreline, riprap, bulkhead, marsh, river, bridge, houses, oyster reef, breakwaters, seawall, waves, flood.

3. Generate 5-8 images using different prompts. Prompts can be like 'a shoreline with a garden and houses and a seawall.' This process should take no more than five minutes, fifteen tops.

Your results should look something like this. Please send me your images and be prepared to discuss on Tuesday for your participation grade for the class..."



Figure 1. OpenArt.ai example for Spring Seminar in Sea Level Rise. Author Image.



Figure 2. Another OpenArt.ai example for Spring Seminar in Sea Level Rise. Author Image.



Figure 3. The last OpenArt.ai example for Spring Sea Level Rise class prompt. Author image.

GenAI as Opportunity for a Critical Design Practice

A similar exercise was implemented again during the week of Green Infrastructure instruction in the following Fall 2025 seminar within the seminar series. The following prompt was provided in order to generate similar results, though the choice of platform was now open-ended. While the explicit purpose of the assignment was not to compare the output styles and proclivities of the various tools, further pedagogical advances may strive to examine the various levels of bias.

Hello team,

I hope this finds you well. I wanted to reach out with your homework for Thursday. It involves generative AI (GenAI) and should only take you a few short minutes. Here are the instructions:

- 1. Open up your favorite GenAI tool or make a free, minimal account with recraft.ai.*
- 2. Create several images that combine three of the following keywords in an order that you choose: Bioswale, dry swale, retention pond, storm drain, French drain, rain garden, rain barrel, cistern, green roof, tree box, reservoir*

Example: Make me an image of a reservoir next to a street with three tree boxes and a storm drain.

- 3. Upload the image you think is most realistic, and we will discuss in class.*

Implementing prompts such as “Make me an image of a flooded street between two bio swales with intermittent boxed trees” created images like this one, created in Microsoft Copilot:



Figure 4. Flooded street between two bio swales with intermittent boxed trees. Author image.

Critical to this pedagogy is the critical eye that the students and faculty must take regarding the GenAI outputs. For example, in the above image, the ‘intermittent boxed trees’ do not appear to be in boxes, and the bio swale plants are in the boxes meant for the trees – not in the ground as they need to be to function. As the image is very realistic on the surface, with compelling reflections in the water, ripples, and differentiated leaves on vegetation, it can be tempting as a viewer to accept the graphic as it is. The teaching task within this assignment’s class discussion is to encourage the students to critique one another’s work and learn the limits of GenAI in the landscape urbanism field, even as they begin to see its potential for applications across the suite of architecture learning goals. Central to this strategy is another layer of concern for the kind of built environment being represented, and whether a narrow band of designs and architectural styles are represented. Creating the prompt of “Make me an image of a flooded street with damaged houses and two bio swales with street trees” in Copilot yields the following image.



Figure 5. Flooded street with damaged houses, swales, and boxed trees. Author image.

In this image, the houses look as though they are older, modest, single-family dwellings. The image is otherwise the same as the previous generation as regards street conditions. In the next image, with the prompt ‘make me an image of a flooded street with houses and two bio swales and street trees’ displays suburban dwellings – newer, larger, denser – on the left. The difference between damaged, modest buildings in a more rural community and more regal intact ones in a suburban-style community can be construed as an element of bias within the model, which would bear discussion in class.



Figure 6. Flooded street with suburban houses, swales, and boxed trees. Author image.

Therefore, while there is generally a focus on the direct image and landscape urbanism depictions relevant to storms, flooding, and adaptation to sea level rise in the course instruction, there remains

the potential for engaging with ethics issues around prejudice and bias baked into the GenAI models.¹⁴

CONCLUSION

Significant research and teaching opportunities remain in the GenAI space for these courses as they approach landscape urbanism through visualizations and renderings of the built environment. As images that would take hours or days to create can be generated in only a few moments with software like OpenArt.ai, recraft.ai, and Microsoft Copilot, among others, the potential for rapid iteration and refinement becomes not only a possibility but a known fact. In a field like architecture, where the art of the rendering and the digital 3D model can make or break a presentation or unbuilt creation, the addition of GenAI to an already formidable mix of graphical options may also create more confusion and competition in a glutted space. The best use of the new technologies may remain at the beginning of the design process, where they rapidly facilitate the trying and discarding of many related ideas in a short frame of time. Within this system, over eight or more iterations, only one may hold the potential for further development, but the process may also yield more insights for what does not work, possibly preventing later mistakes down the line. A critical eye is central to these processes. Accepting the production of a GenAI tool without responding to its shortcomings presents a narrow shortcut from a hunch or question to a polished answer that appears relevant, whether or not the model has rendered an impossible construction. AI-generated videos and other moving graphics stand as a continuous learning frontier within the architecture sphere. Flythroughs, walkthroughs, and other advanced virtual 3D modeling artifacts may benefit from these technologies at later stages of the design process for landscape urbanism classes like these ones. As always, the user must remain alert to mistakes, and must be the final judge of whether an image or video fits the prompt, or will end up as digital junk.

Copyright Statement

All AI images in this paper were created in OpenArt.ai using the Flux model or in Microsoft CoPilot. Care was taken to ensure the avoidance of direct replication of others' work or copyright infringement, and the creative process was designed to avoid harmful or insensitive material. These images are used here under fair use as material for pedagogy development and instructive critique.

Figures

1. Openart.ai – Flux model. *Church and Surroundings 1*. Author's Image. Reproduced under Fair Use.
2. Openart.ai – Flux model. *Church and Surroundings 2*. Author's Image. Reproduced under Fair Use.
3. Openart.ai – Flux model. *Church and Surroundings 3*. Author's Image. Reproduced under Fair Use.
4. CoPilot AI. *Flooded street between two bio swales with intermittent boxed trees 1*. Author's Image. Reproduced under Fair Use.
5. CoPilot AI. *Flooded street between two bio swales with intermittent boxed trees 2*. Author's Image. Reproduced under Fair Use.
6. CoPilot AI. *Flooded street between two bio swales with intermittent boxed trees 3*. Author's Image. Reproduced under Fair Use.

NOTES

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- ⁶ Sarah Bankins and Paul Formosa. "The Ethical Implications of Artificial Intelligence (AI) For Meaningful Work." *Journal of Business Ethics* 185, no. 4 (2023): 725. <https://doi.org/10.1007/s10551-023-05339-7>.
- ⁷ Sarah Bankins and Paul Formosa. "The Ethical Implications of Artificial Intelligence (AI) For Meaningful Work." *Journal of Business Ethics* 185, no. 4 (2023): 725. <https://doi.org/10.1007/s10551-023-05339-7>
- ⁸ Ray Eitel-Porter. "Beyond the Promise: Implementing Ethical AI." *AI and Ethics* 1, no. 1 (2021): 73. <https://doi.org/10.1007/s43681-020-00011-6>
- ⁹ Hacer Güner and Erkan Er. "AI in the classroom: Exploring students' interaction with ChatGPT in programming learning." *Education and Information Technologies* 30, (2025): 12681.
- ¹⁰ Hacer Güner and Erkan Er. "AI in the classroom: Exploring students' interaction with ChatGPT in programming learning." *Education and Information Technologies* 30, (2025): 12682.
- ¹¹ Jennifer M. Higgs and Amy Stornaiuolo. "Being Human in the Age of Generative AI: Young People's Ethical Concerns about Writing and Living with Machines." *Reading Research Quarterly* 59, no. 4 (2024): 632. <https://doi.org/10.1002/rrq.552>.
- ¹² Brent Mittelstadt. "Principles Alone Cannot Guarantee Ethical AI." *Nature Machine Intelligence* 1, no. 11 (2019): 501. <https://doi.org/10.1038/s42256-019-0114-4>
- ¹³ Wenbin Zhang. "AI Fairness in Practice: Paradigm, Challenges, and Prospects." *AI Magazine* 45, no. 3 (2024): 386. <https://doi.org/10.1002/aaai.12189>.
- ¹⁴ Monteith, Scott, Tasha Glenn, John R. Geddes, Peter C. Whybrow, Eric Achtyes, and Michael Bauer. "Artificial Intelligence and Increasing Misinformation." *The British Journal of Psychiatry* 224, no. 2 (2024): 33. <https://doi.org/10.1192/bjp.2023.136>.
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THE FOREST IS OUR CLIENT

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INTRODUCTION

"We are not outside the ecology for which we plan – we are always and inevitably a part of it. Herein lies the charm and terror of ecology."

Gregory Bateson, Steps to an Ecology Mind (1972)¹

"Ecology must stop being associated with the images of small nature-loving minority or with qualified specialists. Ecology in my sense questions the whole of subjectivity."

Felix Guattari, The Three Ecologies (1989)²

In 1891 Congress passed the Forest Reserve Act that allowed the President to "set apart and reserve ... public land bearing forests ... or in part covered by timber or undergrowth, whether of commercial value or not, as public reservations." These forests were set aside not just for the protection of timber, but as a way to "preserve the fauna, fish and flora of our country, and become resorts for the people seeking instruction and recreation" as noted in the 1891 Interior Annual Report. While land was being reserved as National Forest, it was not until the Forest Service Organic Administration Act of 1897 designated funds and management provisions to oversee these forests. These lands were then further defined with the creation of the National Parks which placed restrictions on the use of the land for its natural resources and placed a higher level of preservation of the ecosystem for future generations but still maintained the mission of allowing for the enjoyment of these places. In 1918 the National Park Service (NPS) founding mission within the Organic Act describes its role "to conserve the scenery and the natural and historic objects and the wildlife therein and to provide for the enjoyment of the same in such manner and by such means as will leave them unimpaired for the enjoyment of future generations." After its reorganization in 1933 the NPS began a strong advertising campaign which generated a series of posters through the WPA that framed the West as something to be consumed. Nowhere in these discussions were the implications of the carbon footprint of traveling to and enjoying these places, the ever increasing maintenance required given the increase in visitation and intensification of fires, or the importance of these lands, not as a resource to be consumed, but a resource for carbon sequestering and global ecological security.

A significant amount of these lands exist in the Mountain West and have now become a major economic driver through tourism and recreation on these lands. Montana alone sees almost 12 times its population in annual visitation, accounting for \$5 billion in non-resident spending with over \$1.2 Billion of that on fuel. The Montana State Parks in 10 years have seen a 45% increase in visitors and the Bozeman airport has seen over a 1300% increase in passengers over the last 30 years.³ Yellowstone National Park attracts more visitors (4.74 million in 2024) than the population of Idaho, Montana and Wyoming combined for this "enjoyment" of nature. The 310 miles of paved roads, over

1,500 buildings and approximately 750 employees allow visitors to consume wilderness with ease.⁴ The NPS mission clearly predicted the difficulty facing the West - how to enjoy this place in a way that allows it to persist.

Understanding that architecture does not change the petroleum based modes of transportation, but does have a significant impact on our long term sustainable occupation of these lands, this paper presents the studio findings of students addressing how the infrastructure of occupying and maintaining these lands can improve the ecology through an architecture of mutualistic inhabitation. This studio situated students in fragile and remote places that require structures because of our visitation as a means of examining the larger context of inhabitation in the rapidly growing Mountain West. The studio prompt starts with the following questions: What is Nature and what is our relationship to Nature? In the context of global urbanization, how do we define, engage and value Nature? What does Nature mean for residents and visitors of the National Parks? As our anthropocentric actions have a global impact on Nature, can we move beyond site net zero towards a new model for our engagement with Nature that is carbon negative / ecologically positive? Can our occupation and enjoyment of the National Forests and Parks shift from the mentality of “leave no trace” to one of mutualistic benefit? Can our presence within Public Lands improve the sustainability of not just the ecosystem, but our global ecology?

“Human activity has become such a dominant, disruptive source of change on a planetary scale that the biologist Eugene Stoermer coined the term Anthropocene to describe our current planetary epoch. Trends in climate change, a loss of biodiversity, and dissolution of social fabrics can seem already beyond our control or influence. We are at a critical juncture. What does it mean to practice design in the Anthropocene Age? How should we modify our methods, techniques, and strategies when every process and cycle is acceleration along an unknowable trajectory? What is the agency of the urban designer? How do we not just make landscapes, buildings and public spaces, but make change?”

Kate Orff, *Toward an Urban Ecology* (2016)⁵

CONTEXT

We have radically informed the present-day West in ways that may not be evident. Our impact is not just in the construction of roads and communities. Our policies and language are perhaps more impactful than our presence. We have expanded our extraction off these lands beyond resources to that of tourism and experience. The notion of Wilderness as being desirable, and not something to be feared or a place that was desolate, did not occur until the 19th Century when we see the start of visiting these places for pleasure and begin enacting policies to protect them for our enjoyment. William Cronon describes Wilderness as “Far from being the one place on earth that stands apart from humanity, it is quite profoundly a human creation” questioning if we can still have the desired nature that draws people.⁶

As we continue to see increases in population in the state of Montana and increases in visitation to the National Parks, the importance of the need to properly manage these places significantly grows. However, the relationship between use and budget continues to be an issue as does the education of the people that use the National Forest system. The budget for the national forest service is rapidly being consumed by the fighting of forest fires, shifting from 16% of the budget in 1995 to approximately 50% in 2020. The 2018 Consolidated Appropriations Act included the “fire funding fix.”, which created access to over \$2 billion in emergency funds to offset these costly fires and is evidence of a significant need for long term sustainable strategies to address these ever increasing expenses.⁷ This is further impacted by the ongoing discussions and actions of reducing the budgets and staff of our National Parks and Forests. All of this combined is putting a significant strain on other maintenance of these lands and limiting the ability to educate the public about the importance of

these places and how to be good stewards and not consumers as the goals of the Forest Service and the desires of people to enjoy these places can be oppositional. As with any occupation of a place, even the most conscientious visitor does some level of harm to the ecosystem. We can look at the increasing visitation of these lands, growing at a faster rate than population growth, and ask the question “are we loving these places to death, and what role can architecture play given these parameters?”



Figure 1. Yellowstone National Park service building, Mammoth, Wyoming.

STUDIO FRAMEWORK

As a way of examining these issues within the context of the agency possible through design and the built environment, students were assigned sites within Yellowstone National Park and the Lee Metcalf Wilderness. These two sites have many similarities in appearing to be wild and natural places, but are governed by policies that are incredibly different which can be seen in their missions. The National Parks seek to preserve the natural and cultural resources for enjoyment, education and inspiration while Wilderness is defined by a place untrammelled by man, where man himself is a visitor and does not remain. The implications of their policies extends to how any modifications and structures can exist within these boundaries. In the National Parks, any alterations and additions must not radically change, obscure or destroy significant spatial organization, materials and features. In Wilderness, no structures are allowed with the exception of those in place prior to the Wilderness designation or if the structure is an extension for environmental management. One of the most significant overlaps of these two approaches is in Yellowstone where over 90% of the Park was recommended by the Secretary of the Interior in 1972 for a designation of federal wilderness under the Wilderness Act of 1964. While Congress has not acted upon this recommendation to date, this portion of the Park is managed such that it could receive this designation in the future.⁸ Through examining the maintenance and inhabitation of these fragile and complex places, the students designed within the context of what role human inhabitation plays within the ecology and the implications of our growing visitation and

population. The projects responded to the interconnected relationships, not always visible, that have informed the place and set our current trajectory to find new opportunities. All investigations grappled with the premise that we might be “loving these places to death”, asking how do we proceed as we are inextricably tied to both the idea of and the physical experience of these lands?

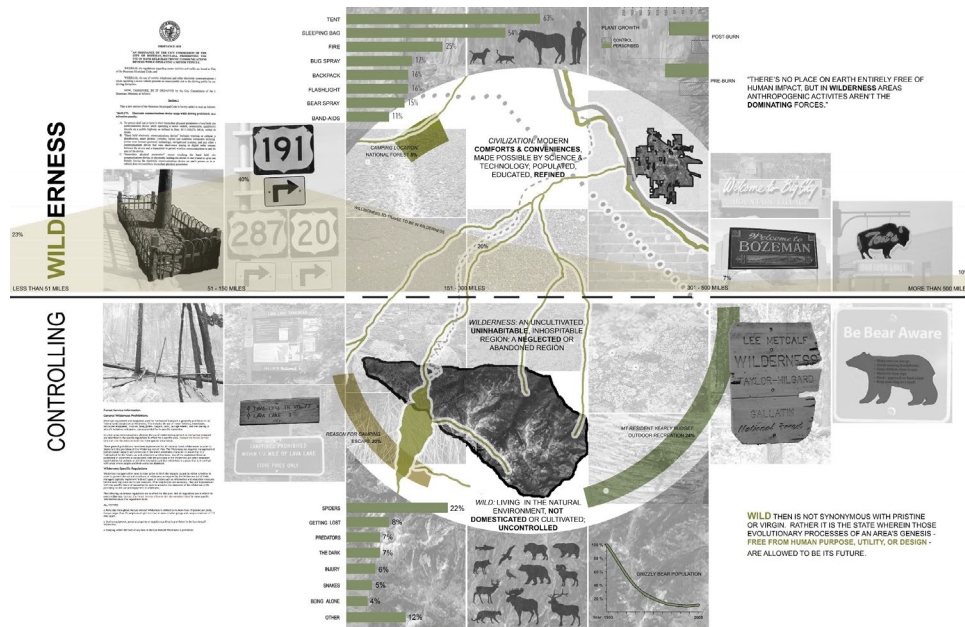


Figure 2. Mapping Wilderness, Mary Demro.

STUDIO INVESTIGATION

Within the context of the immense infrastructure and maintenance required to keep Yellowstone National Park accessible to visitors, student projects examined how the constructed and human presence could be integrated with ecological function to not only offset the impacts but to seek ways of improving through construction and daily activity. Something not readily visible, and likely not something visitors want to see, is the large fleet of machinery needed to maintain the roads and buildings within the park. By embracing this reality and seeing it as an opportunity to advocate for funding the Park system, students proposed situating these structures within full view of visitors traveling through Yellowstone. The structures were designed to highlight the importance of these efforts rather than trying to hide the over 500 vehicles in the Park's fleet. The designs also were in contrast, but sympathetic, to the historic structures to be didactic in their sustainability and ecological benefit by foregrounding energy production and stormwater management. In this way, the new structures demonstrate the ongoing efforts of reducing the impact of inhabiting this landscape.

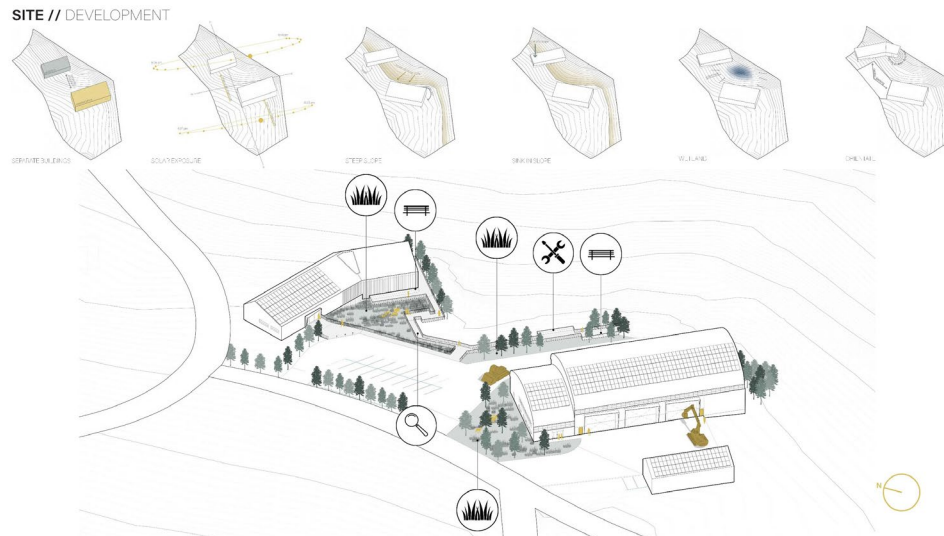


Figure 3. Mammoth maintenance facility, Sarah Flach.

One of the most significant pieces of infrastructure to the national parks are the employees that not only provide the operations, but also provide education and oversight for visitors to ensure that they are not harming these fragile places. In Yellowstone, the park relies on a significant number of summer employees as that is the time when the park is fully open and sees its largest visitation. Due to funding limitations, much of the housing for these seasonal employees is substandard. The existing structures are inefficient in their resource consumption and are a deterrent to hiring because of their quality. Through an analysis of summer employee surveys, one project identified that the human infrastructure was critical to the longevity of protecting the Park and focused on housing. The project proposed a consolidation of housing on already disturbed land to reduce impact and increase efficiency. The project also centered around creating communal spaces to support non-work related activities, something that was identified as one of the most significant attributes of finding new friendships through the summer employment.

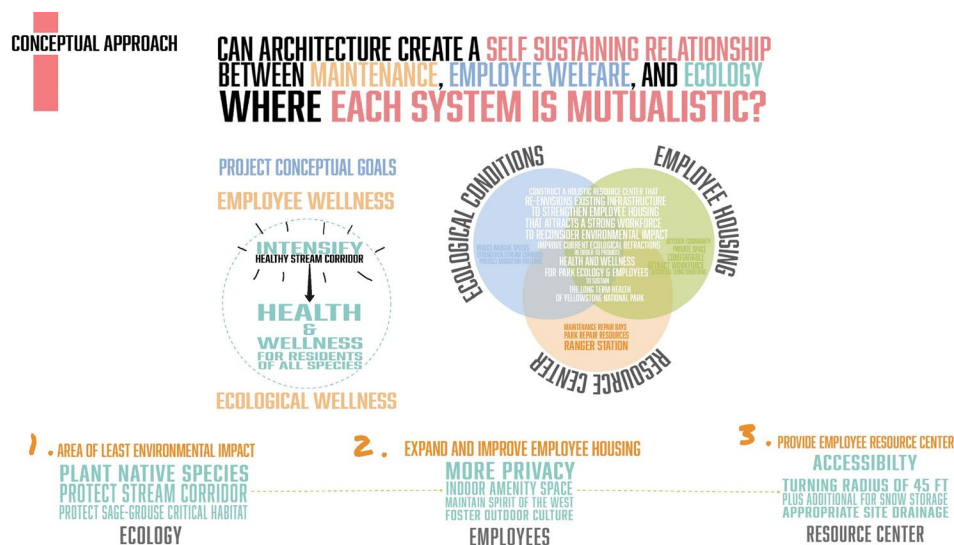


Figure 4. Conceptual approach diagram, Ryen Dalvit.

Within the context of the desired inhabitation of the Lee Metcalf Wilderness, design strategies emerged creating places to observe and engage nature as a mechanism to link into larger systems and

seek to improve the ecosystem through human occupation. The projects seek to leverage opportunities within existing systems to propose an architecture of mutualistic occupation by identifying human desires that could create feedback loops. A common thread for all of the projects located in Wilderness was a recognition that educating both visitors and the broader public were critical to maintaining this land within the framework of the Wilderness Act as the Wilderness boundary is only marked with a sign along the trail and difficult to distinguish a difference between the forest on one side or the other. Projects looked at bringing educational engagement opportunities closer to the roadways as a means of both expanding access to knowledge and possibly reducing, not limiting, potential visitation deeper into the woods. Other projects looked at how sensitive interventions deeper into the Wilderness could frame educational opportunities while also serving human desires to see wildlife and experience nature while supporting ecological function.

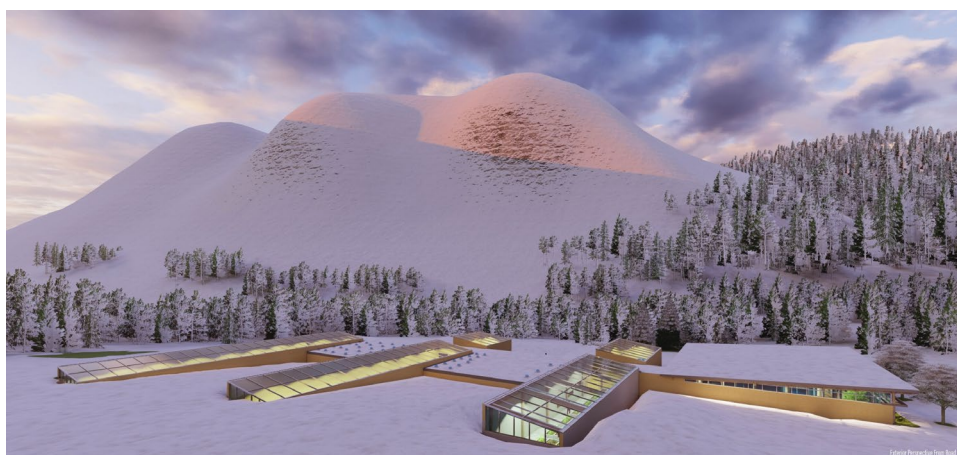


Figure 5. Visitor Center and Greenhouse, Tiffani Finley.

The projects ranged in both scale and programmatic complexity to address the ongoing threats and maintenance needs of the Forest. Two of the most significant threats beyond the deterioration of visitation are invasive species and fires. Several projects identified the need for a roadside stop for travelers with the opportunity to extend that rest with a nature-based education related to the ongoing efforts of managing invasive species and reforestation efforts. Similarly, one project utilized a larger field adjacent to the road to establish an energy plant associated with the necessary clearing and thinning of the forest to reduce fuel load associated with a century of misguided wildfire management. By bringing these elements adjacent to the road, the scale of these management efforts becomes tangible. One project focused on the fundamental principle of Wilderness of having a "primitive" experience and utilized the campfire as a mechanism for change. Through an analysis of natural fire breaks in the forest at ridges and waterways, the project proposed a distribution of fire rings at these locations so that hikers could easily cook a meal and keep warm while also reducing the fuel load of brush and fallen dead trees to reduce the spread of forest fires. Another project embraced the natural and ecological importance of fire to create structures made completely of plant based and non-combustible materials. Through this approach, the structures can burn without releasing any toxic materials and can be rebuilt on the concrete foundations after a fire to reestablish a management outpost.

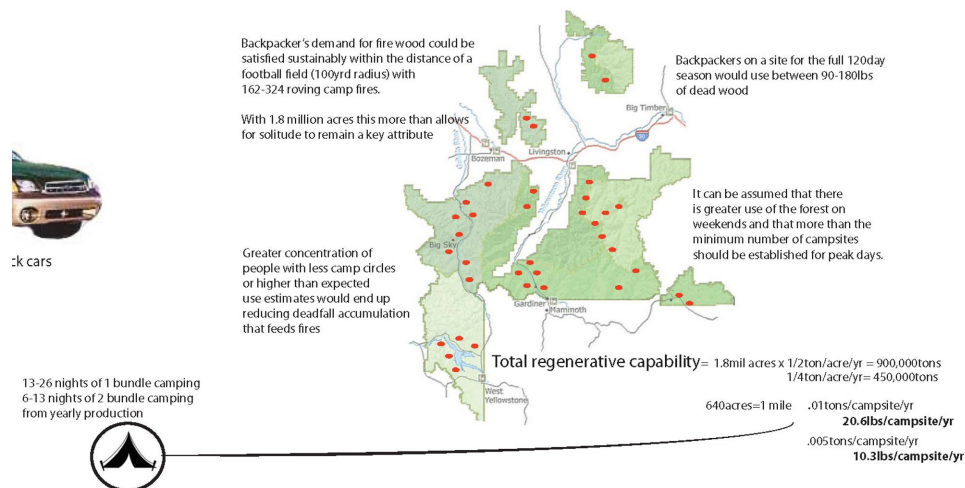


Figure 6. Fire management strategy, Jessica Proctor.

Finally, one project focused on the road itself as a way to protect and connect people to the environment. In examining the ongoing efforts of the Yellowstone to the Yukon conservation efforts to provide a connected migration network for numerous species, the impact of high-speed roads on impeding migration and animal fatalities became the focus. The project identified critical locations of the contiguous migration paths that were only interrupted by high-speed roads and proposed a reconfiguration that reduced travel speed, provided clear sightlines for animals and reduced the impact of stormwater while also enhancing the drivers' experience with nature. This approach, different from the land bridge, engages people in conservation efforts as it changes the known experience of highway travel for just a few minutes rather than being something to just pass by at high speed.

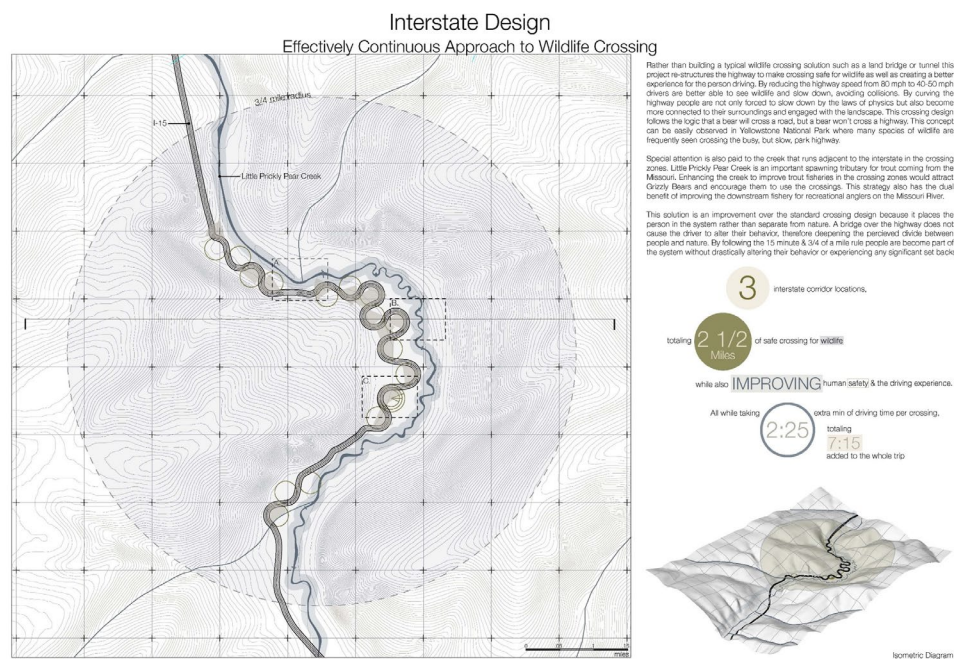


Figure 7. Proposed interstate revision, Claire Pepper.

CONCLUSION

Through all these approaches, the designs sought to leverage the human experience and relationship to nature to heighten an awareness of the significance of these places in a context that was different from the known of being out in nature. Pedagogically this was a significant part of the framework for the studio as it taught students about the potential agency for their design for positive impact in places that are often not considered part of the built environment. It also opened conversations that shifted a common perception that when people “escape” to nature that they are disconnected from the impact of the carbon footprint of the urban / suburban development where they live.

As the world is becoming increasingly complex and we have a greater understanding of the interconnected nature of a global society, the design challenges for future architects will expand beyond buildings as a place for inhabitants. Architecture will need to engage in a systemic analysis of the context to seek opportunities to leverage latent potential as a catalyst for larger influence and ecological sustainability. Projects that can understand the implications of their existence in a larger, rapidly changing context are more proactive and create future resiliency. Projects of this nature also give a new agency to the designer who can manage the complexities of the context and provide value beyond the physical space and influence decision making and policy. This approach to architecture has the capacity to move beyond minimizing our environmental impact to seek design strategies that truly are mutualistic in our occupation.

NOTES

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DECOLONIZING ERGONOMICS: RETHINKING DESIGN PEDAGOGY THROUGH EVERYDAY PRACTICE IN BANGLADESH

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INTRODUCTION

Ergonomics, as a field of study, has historically evolved around standardized anthropometric measurements and prescriptive design criteria aimed at optimizing interactions between human bodies, tools, and environments. This discipline emerged primarily in industrialized Western contexts, formalized to enhance efficiency, comfort, and safety in occupational and domestic environments. Foundational references, such as *Time-Saver Standards*¹ and Neufert's *Architects' Data*,² have profoundly shaped architectural and industrial design education worldwide. These manuals rely on datasets collected predominantly from North American and European populations, reflecting bodily proportions, postures, and work environments specific to these contexts. Over decades, such standards were codified through professional associations, international committees, and accreditation systems, influencing global design practices including furniture dimensions, workstation layouts, safety protocols, and spatial planning guidelines.³

Despite their global influence, these standards are neither universally representative nor culturally neutral. Anthropometric research demonstrates significant variation across populations in height, limb length, joint mobility, reach ranges, and habitual postures.⁴ Applying universal percentile ranges to design often misrepresents underrepresented populations, resulting in poor ergonomic fit, discomfort, and potential injury. Beyond quantitative representation, decolonial scholarship highlights epistemic and ethical issues inherent in asserting universality. Ergonomics, like other design disciplines, reflects Eurocentric assumptions regarding comfort, productivity, and appropriate bodily comportment.⁵ The issue is not merely insufficient data; it is the implicit assumption that one normative body can define design standards for all humans.

Decolonizing ergonomics therefore requires interrogating these conceptual foundations. It entails questioning who defines the “universal” body and how such design knowledge reproduces social, cultural, and economic hierarchies. This paper situates these concerns within a pedagogical experiment conducted in a second-year undergraduate architecture design studio in Bangladesh. The studio critically examined the universality of ergonomic standards through the lens of neighborhood tea stalls, a ubiquitous and culturally embedded typology. Students studied domestic and informal labor postures, documented ergonomic adaptations, and translated these insights into context-responsive design proposals. The tea stall served as a site through which ergonomics could be

understood as culturally situated, relational, and embodied knowledge rather than a purely technical framework.

This project proposes a decolonial approach to design pedagogy, emphasizing observation, bodily engagement, and dialogue with vernacular knowledge systems. By grounding learning in local realities, the studio challenges ‘one size fits all’ assumptions embedded in conventional curricula while fostering design practices attentive to climate, material ecologies, and social negotiation.

LITERATURE REVIEW: ERGONOMICS, COLONIALITY, AND EVERYDAY PRACTICE

Ergonomics and the Making of Universal Bodies

Modern ergonomics consolidated in Europe and North America during and after World War II, shaped by military research imperatives, industrial efficiency goals, and the rapid expansion of mass production industries. Research agendas focused on optimizing productivity, performance, and safety, producing extensive anthropometric datasets that transformed human bodies into measurable variables for design purposes.⁶

Professional institutions codified these measurements into guidelines intended to inform furniture, machinery interfaces, and spatial layouts. Percentile charts and dimensional ranges became authoritative references, guiding design across workplaces, schools, and public infrastructures. While these standards allegedly enhanced usability and safety, they were primarily derived from limited populations—Western, male, and industrial workers. Consequently, these references implicitly constructed an “ideal” or “average” body, reflecting specific socio-cultural and economic contexts rather than universal human diversity.⁷

Reducing human bodies to averages and percentiles frames bodily difference as deviation from a presumed norm. Design becomes oriented toward conformity rather than embracing plurality. From a decolonial perspective, such abstraction resonates with earlier scientific traditions that categorized and hierarchized bodies to justify political and social hierarchies.⁸ Universalist ergonomic science risks masking cultural specificity while sustaining normative hierarchies under the guise of objectivity.

Ergonomics as Governance

Ergonomic standards function not merely as descriptive science but as prescriptive technologies that define how bodies should sit, lift, reach, and perform tasks. Drawing on Foucault’s framework of disciplinary power, ergonomic guidelines can be understood as mechanisms regulating bodies within industrial and service systems.⁹ By defining “appropriate” postures, movements, and rhythms, ergonomics shapes compliant subjects aligned with productivity and efficiency imperatives.

When these models are exported globally through development initiatives, international design education, and standardized manufacturing systems, they reproduce asymmetrical power relations. Universal prescriptions frequently ignore local labor practices, climatic conditions, material cultures, and habitual postures, marginalizing situated knowledge and privileging technocratic expertise over lived experience.

Parallel critiques emerge from adjacent disciplines. Behavioral research underscores the dominance of WEIRD populations in empirical studies, raising questions about the generalizability of findings.¹⁰

Human–computer interaction studies demonstrate that assumptions regarding user behavior, comfort, and cognitive processes are culturally embedded, further exposing the epistemological limitations of universal claims.¹¹ These critiques collectively challenge the authority of global ergonomic standards and underscore the need for culturally grounded approaches.

Everyday practice as counter-ergonomics

Theories of everyday life provide a framework for understanding ergonomics beyond prescriptive standards. Everyday practice is where abstract norms meet embodied, lived realities. Individuals adapt, improvise, and reinterpret imposed structures, demonstrating tacit knowledge and practical strategies for coping with material, social, and environmental constraints.¹²

Empirical research in informal economies reveals continuous adaptation in response to misaligned design prescriptions. Work surfaces are modified, tools repositioned, and postures adopted to optimize endurance, sociability, and spatial efficiency rather than biomechanical ideals. Participatory design scholarship emphasizes users as co-producers of knowledge, challenging the hierarchical positioning of expert-defined standards over vernacular practices.¹³

Through this lens, ergonomics emerges as negotiated, contextually embedded practice rather than fixed technical prescription. Everyday adaptations reveal design knowledge shaped by climate, economy, culture, and habitus, demonstrating that deviation from standardized norms often represents embodied intelligence rather than deficiency.

Toward Situated Ergonomics

Situated ergonomics frames design knowledge as relational, context-sensitive, and dynamic. Comfort, safety, and efficiency arise through interactions among bodies, materials, climate, and social relations rather than abstract norms.¹⁴ Measurement remains relevant but must be interpreted within cultural and environmental contexts. Designers engaging with everyday bodily practices generate insights that transform difference into innovation rather than treating it as deviation from an imposed norm.

This theoretical orientation underpins a combined framework that helps us to critically question the western version of ergonomics employed in the architecture design studios in Bangladesh. The pedagogical approach in the design exercises described in the following sections emphasizes observation, embodied engagement, iterative experimentation, and direct interaction with traditional practices. Situated ergonomics emerging out of the design exercises aligns with postcolonial epistemologies advocating partial perspectives and plural knowledge systems, foregrounding multiple ways of knowing and doing in design practice.

METHODOLOGY: STUDIO AS RESEARCH SITE

This study employs a practice-based research methodology embedded within a second-year undergraduate architecture studio. The studio brief, developed for a cohort of forty-one students, focused on neighborhood street tea stalls and its micro-architectures supporting labor, social interaction, and public life. Tea stalls, ubiquitous in South Asia, offer compact, informal environments ideal for examining the negotiation of bodily practice, workflow efficiency, and social engagement.

Students' observations captured postures, gestures, circulation, tool arrangements, and environmental adaptations. Informal interviews with vendors documented tacit knowledge and decision-making processes. Fieldwork methods included sketches, measured drawings, and photography, with particular attention to negotiating confined spaces, crowding, heat, smoke, and social density.

Fieldwork was followed by iterative model-making and material experimentation. Students engaged with bamboo, recycled wood, metal sheets, and clay, exploring scale, proportion, and spatial organization derived from observed bodily practices. Evaluation emphasized cultural responsiveness, environmental sustainability, and reparability rather than strict adherence to imported ergonomic tables. Prototyping included modular counter heights, flexible seating, and adjustable preparation surfaces informed by ethnographic observation. Students documented multiple iterations of spatial arrangements to analyze interactions between vendors and customers under peak and off-peak conditions.

DESIGN PROCESS AND STUDIO OUTCOMES

Phase one: Everyday domestic ergonomics

The first phase examined bodily postures associated with everyday domestic activities such as food preparation, cooking, eating, and washing dishes. Students documented traditional floor-based practices alongside Western furniture-based systems (See Figure 01, Figure 02). Ground-oriented postures—squatting, kneeling, floor sitting—remain prevalent across everyday activity practices. Western ergonomics often labels these postures as inefficient. However, anthropological and physiological research demonstrates that such postures are sustained through lifelong conditioning, joint mobility, and muscle memory.¹⁵ Discomfort often results from disrupted habituation rather than inherent ergonomic deficiency.

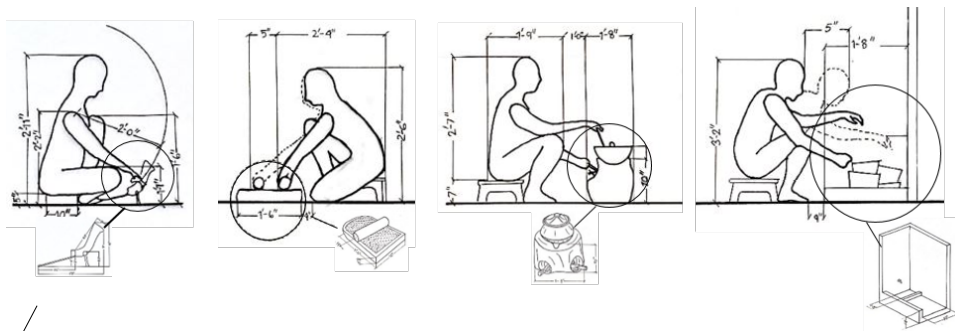


Figure 1. Traditional way of preparing a meal: cutting, grinding spices, cooking, cleaning

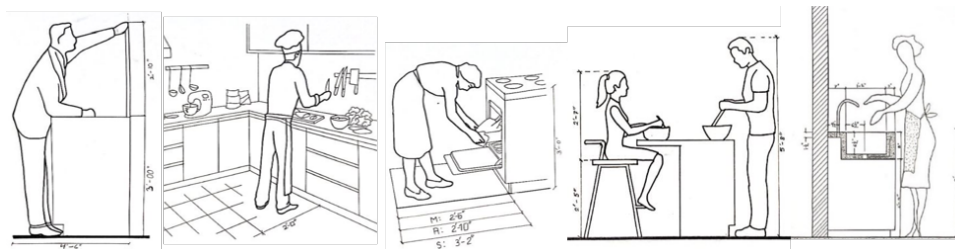


Figure 2. Western way of preparing a meal: storage, chopping, cooking, serving, cleaning

Comparative analysis revealed comfort and efficiency as culturally constructed. Floor-based cooking reduces storage needs and adapts to ventilation patterns, while shared floor seating fosters social proximity and collective engagement. Ergonomic performance is relational, emerging from climate, repetition, material availability, and cultural continuity. The identification of the mismatch between standardized ergonomics and lived bodily practice helped challenge assumptions about universal standards and highlighted the value of locally evolved practices.

Phase two: Exploring everyday ergonomics in traditional street tea stalls

A significant portion of labor in the Indian subcontinent occurs within the informal economy, encompassing street vendors, artisans, rickshaw pullers, construction workers, and agricultural laborers.¹⁶ Tea stalls particularly exemplify compact, improvised workspaces shaped by climate, mobility, and economic constraints. In this phase, students examined everyday ergonomics within informal labor environments, focusing on neighborhood tea stalls. Students conducted field visits to document existing tea stalls through observation, sketches, photographs, and measured drawings (Figure 03).



Figure 3. Components of an existing street tea stall

Fieldwork revealed continuous adaptation. Vendors modified counter heights, repositioned tools, adjusted handles, and reorganized surfaces to optimize comfort and workflow efficiency. Students mapped movement patterns, peak-hour crowding, reach distances, and vendor–customer interactions. Ergonomic mappings captured how vendors prepared tea, served customers, handled utensils, and negotiated confined workspaces (Figure 04). Material choices, shading strategies, and the stall's relationship to the street were also recorded to understand environmental adaptation.



Figure 4. Images of small-scale adjustments in a negotiated space

MAKING TEA

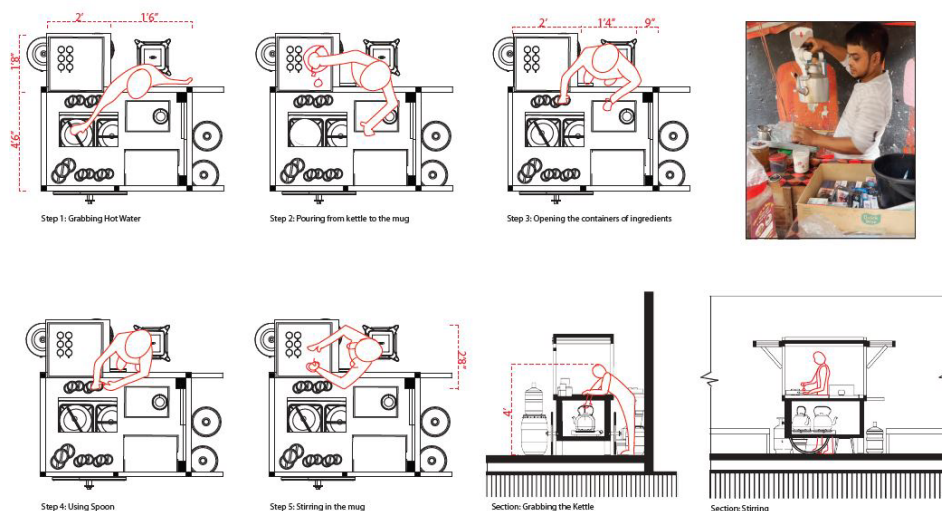


Figure 5. Preparation of tea in a traditional street tea stall

The tea stall functioned simultaneously as vending infrastructure and micro-public space, illustrating ergonomics as tacit, negotiated, and contextually responsive.

Phase Three: Conceptual Translation and Design Development

In the third phase, students translated field observations into conceptual design principles. Ethnographic insights informed ergonomic configurations, material selection, and spatial layouts. Adaptable work surfaces, modular seating, and flexible storage systems were prioritized to support multiple postures and tasks simultaneously. Students considered sociocultural factors, such as the need for communal gathering, gendered labor practices, and customer interaction patterns, ensuring that design proposals respected local social norms.¹⁷

Iterative sketches and models allowed students to test the spatial relationships between vendors and the performed activity. Small-scale prototypes explored circulation, reach, and ease of access for tools and ingredients. Feedback sessions with vendors helped refine drawings, highlighting the practical value of participatory design in negotiating real-world constraints (Figure 04). For instance, some vendors preferred slightly elevated counters to reduce squatting strain, while others emphasized the importance of shaded seating areas for communal interaction. The used materials like bamboo, metal sheets, recycled wood, and clay were evaluated not only for durability but also for tactile comfort and cultural resonance. Students observed how material flexibility and modularity enabled rapid repair and adaptation to seasonal changes, reinforcing the importance of local ecological knowledge in design decisions.¹⁸

By the end of this phase, students had produced refined prototypes integrating ergonomic, social, and environmental considerations, demonstrating that everyday practice could generate innovative design solutions grounded in local realities (Figure 06).

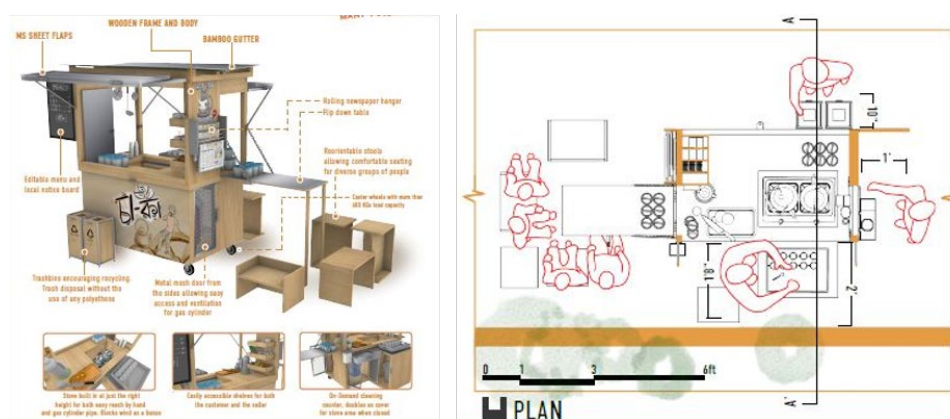


Figure 6. Example of final outcome emphasizing on the aspect of social gathering

Phase Four: Reflection and Presentation

The final phase emphasized critical reflection and knowledge dissemination. Students presented drawings, scaled models, and narratives that articulated how their designs responded to field observations and culturally situated ergonomics (Figure 07). Reflection sessions encouraged students to evaluate their assumptions about comfort, productivity, and efficiency, revealing the ways in which Western-centric standards often overlooked embodied intelligence in local contexts.

Through iterative discussion, students recognized that ergonomics is historically, culturally, and materially situated rather than universally determined. Field-based observation revealed nuanced strategies for optimizing workflow, enhancing social interaction, and mitigating climatic challenges.

This phase reinforced the pedagogical principle that design knowledge emerges from dialogue with the material, environmental, and social realities of everyday life.

The studio outcomes highlighted the potential of small-scale interventions to enhance embodied well-being, environmental responsiveness, and social connectivity. Designs addressed multiple dimensions simultaneously, demonstrating that situated ergonomics can generate solutions that are adaptable, inclusive, and culturally sensitive.

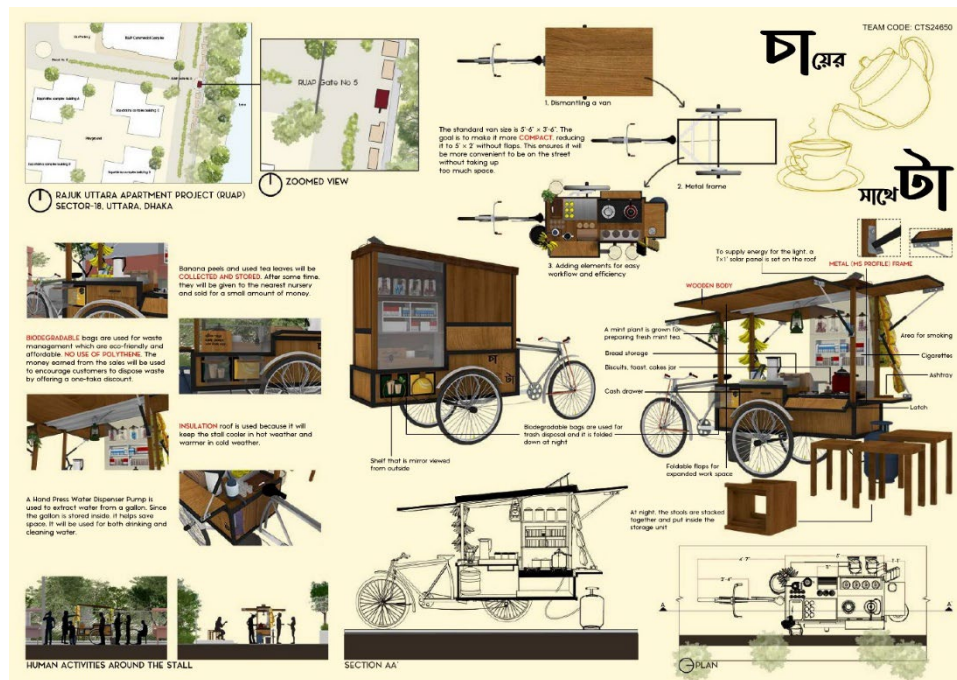


Figure 7. Example of final outcome exploring design decisions through small intervention.

DISCUSSION

The tea stall design exercise served as a critique of contemporary architecture pedagogy adopted in most of the architecture schools in Bangladesh. Ergonomics taught using anthropometric tables, modular grids, and standardized design guidelines derived from Western datasets mask the diversities of human body and their engagement with space through activities.

The pedagogical approach explored through the tea stall design exercise demonstrates that everyday observation, ethnography, and iterative prototyping enable designers to generate solutions that are both functional and socially meaningful. In typical studio environments, informal, vernacular, and improvisational practices are marginalized as deviations rather than treated as legitimate sources of knowledge. The tea stall exercise demonstrated the limitations of this approach, revealing the rich diversity of postural strategies, material improvisations, and spatial adaptations in everyday informal activities. Ergonomic adaptations observed in informal labor contexts—such as adjustable counter heights, floor-based seating, and dynamic tool arrangements—illustrate the richness of localized knowledge that is often overlooked in standardized frameworks.

Situating ergonomics in everyday practice expands the discipline beyond standardized metrics toward culturally embedded, practice-derived knowledge. This approach contributes to design education by integrating embodied inquiry, critical reflection, and participatory engagement, while advancing decolonial scholarship by revealing tensions between global standards and local realities.¹⁹ By foregrounding observation and participatory engagement, the studio repositioned ergonomics as

negotiation among bodies, materials, and socio-economic conditions. It challenged the uncritical reproduction of universal standards and encouraged critical reflection on whose bodies define design norms. This pedagogical model underscores the importance of integrating local, vernacular knowledge into formal design education.

However, caution is necessary. Informal environments may reproduce precarity, inequality, and unsafe conditions, and these contexts should not be romanticized. Scaling studio-based experiments into broader curriculum reform presents challenges, including resource limitations, accreditation constraints, and entrenched assessment systems. Furthermore, cultural variations require ongoing sensitivity to avoid imposing one form of “improvement” that may inadvertently disrupt local social practices.

Despite these challenges, the pedagogical experiment shows the transformative potential of embedding ergonomics within everyday life. By shifting focus from regulating bodies to learning from them, design education can embrace plural, context-responsive, and ethically grounded practices. Localized, context-sensitive design challenges Eurocentric dominance. By nurturing culturally aware designers it creates opportunities for innovation in informal infrastructures, climate-responsive solutions, and socially inclusive public spaces.

IMPLICATION: TOWARDS A DECOLONIZED DESIGN PEDAGOGY

Reframing ergonomics as situated and relational has significant implications for architectural education in Bangladesh and similar Global South contexts. Curricula heavily influenced by Western conventions often create distance between students and lived local environments. Informal settlements, street infrastructure, and climate-responsive practices receive limited systematic engagement, resulting in disconnect between academic learning and practical design challenges.²⁰

Integrating ethnographic methods, bodily observation, and community engagement can bridge this gap. Field-based learning grounds design inquiry in context, treating informal and vernacular practices as resources for innovation rather than as deficiencies. Students learn to value adaptation, improvisation, and iterative problem-solving while cultivating sensitivity to material ecologies, climatic realities, and social negotiation.

A decolonized pedagogy emphasizes plural embodied experiences over standardized ideals. It nurtures designers capable of responding ethically and creatively to context-specific challenges, fostering practices that are environmentally sustainable, socially inclusive, and culturally resonant. Such pedagogy encourages students to critically examine inherited norms, question universal assumptions, and embrace knowledge co-produced with communities.

CONCLUSION

This study demonstrates that decolonizing ergonomics in architectural pedagogy requires moving beyond the abstraction of standardized measurements and embracing the situated, relational, and cultural dimensions of bodily practice. Through the Bangladeshi tea stall studio, students engaged directly with vernacular practices, informal labor contexts, and environmental conditions, generating context-responsive design solutions that challenge universal assumptions.

The pedagogical approach foregrounded observation, bodily engagement, iterative prototyping, and participatory interaction with users. Students learned to critically assess inherited norms, integrate ethnographic insight, and translate embodied knowledge into design interventions. Outcomes illustrated the potential of small-scale, adaptive interventions to enhance social cohesion, occupational comfort, and environmental sustainability.

Decolonized design pedagogy cultivates designers attuned to plural forms of knowledge, capable of responding to the complex intersections of culture, climate, and materiality. It encourages ethical

engagement with local communities, recognition of vernacular intelligence, and experimentation within informal spaces.

By reframing ergonomics as situated practice rather than universal prescription, the pedagogical approach discussed in this paper contributes to broader debates in design education, human factors research, and postcolonial scholarship. Ultimately, it demonstrates that critical engagement with everyday life can inform pedagogy, innovation, and ethical responsibility, offering a pathway for more inclusive, context-aware, and culturally sensitive design practices in the Global South and beyond.

ACKNOWLEDGEMENT

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PEDAGOGY UNPLUGGED: THE FORCED ANALOGUE DESIGN CLASSROOM

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INTRODUCTION

What happens when a design course is stripped of internet access and traditional research tools? Climate Issues and Activism (CIA) is a three-week summer-intensive course co-taught by professors of environmental politics and graphic design at San Francisco State University (SFSU). One week is spent at a remote field campus with no internet, where students explore local climate issues and develop advocacy campaigns grounded in their field research.

The curriculum was designed using social constructivism, experiential learning, value theory, and object-based learning theory in order to support research and creative development without digital resources. Students used analogue methods (pen, paper, and conversation) to conceptualize and design advocacy campaigns. The course emphasized inquiry, discovery, and hands-on engagement. Students interacted directly with their environment, using observation and shared exploration to generate knowledge and empathy.

These immersive experiences fostered deep learning and collaboration, shifting students' perceptions and behaviors. As Mezirow and other theorists suggest, learning is a social process. This course demonstrates how removing digital crutches can unlock transformative educational outcomes—especially when students are placed in direct contact with the issues they aim to address.

This paper will cover the theories; including social constructivism, experiential learning, value theory, and object-based learning; course preparation; the course itself, and frustrations and lessons learned.

THEORIES

The pedagogy of this course is grounded in several theories of learning and education including social constructivism, experiential learning, value theory, and object-based learning. All of these were used to support the lack of digital resources and the physical engagement with the environment.

Social Constructivism

Russian psychologist Lev Vygotsky theorized that learning occurs during social interaction with other people, cultures, and society.¹ Vygotsky sees learning as dynamic, uneven, socially influenced, and transformative, not a simple accumulation of facts.²

Due to the limited access to digital resources in this class the professors had to create social situations for students to learn from and with each other. In order to do this effectively, experiential learning theory was used.

Experiential Learning

Kolb and Kolb also believe that learning is a social process. However, they view this through the lens of experiential learning theory (ELT) which they base on Dewey's 1938 "theory of experience." Kolb sees experiential learning as "the process whereby knowledge is created through the transformation of experience. ...the combination of grasping and transforming experience."³ The Kolbs's ELT model portrays two dialectically related modes of grasping experience. 1) Concrete experience: Learning by feeling and doing, and 2) Abstract conceptualization: Learning by thinking. Forming theories, models, or generalizations from experiences.

The ELT model also has two dialectically related modes of transforming experience. 1) Reflective observation: Looking back and analyzing what happened, and 2) Active experimentation: Trying out ideas and applying what you've learned in new situations.⁴

Prior to the Kolbs's breakdown of these dialectic modes Dewey warned of the complexity of experiential learning activities:

- An experience cannot simply be fun or engaging to be educational—it must help a person grow or learn in meaningful ways,
- Teachers can't simply rely on experiences to teach by themselves — they have to think carefully about *what kind* of experiences they're creating for students,
- A good learning experience actively involves the student. The goal is not to entertain students, but to help them develop capacities for deeper learning later on,
- A poorly designed experience can limit or distort future learning just as much as a good one can enrich it, and
- Experiential learning is not about isolated lessons or moments—it's about creating a continuous chain of experiences that build on one another.⁵

Taking the Kolbs's and Dewey's concerns into account the professors of the CIA class had to think through the learning outcomes of the experiences and the future state those experiences might bring about when designing the curriculum.

First, we knew that text book learning about the environment would not support experiential learning. Thus we decided to immerse students in the environment by taking them to SFSU's Sierra Nevada Field Campus.

Palmer's 1999 study with over 1000 students in nine countries found that direct experiences in nature have a much stronger influence on developing environmental concern than formal education. Over half of respondents reported that individual outdoor experiences were the most significant factor shaping their environmental attitudes.⁶ Ballantyne and Packer explain that "experiences in the natural environment are extremely important in developing students' environmental knowledge, attitudes and responsible actions."⁷

Second, adopting Donald Schön's notion of learning-by-doing would help students deepen their experiences. In Schon's theory reflection plays a key role in helping the learner internalize their experiences—what he calls "reflection on action." The CIA class has many reflection on action exercises built into the curriculum to support students making sense of their experiences at the field campus.

Third, we needed to figure out how to make the experiences meaningful and long lasting. In order to understand how to do this we looked into value theory.

Value Theory

Values are individual beliefs that motivate people to act one way or another. They serve as a guide for human behavior."⁸ Working with value theory Stern et al. explain that values serve as stable, overarching principles that guide behavior and attitude formation, especially in new situations. They

are shaped mainly during early socialization and are enduring and resistant to change.⁹ Stern et al. discovered that individuals have three types of value-based beliefs towards social issues and Schultz helped define them:

- Egoistic concerns center the individual above all other people and all other living things.
- Social-altruistic concerns value other people (individuals, communities, all of humanity).
- Biospheric concerns value all living things.¹⁰

Thus, pro-environmental behavior requires individuals to move from egoistic to biospheric values. Essentially, individuals will need to sacrifice their materialistic, consumerist behavior.¹¹ A behavior that is seen as prosocial¹² is difficult to achieve as it upends “the human tendency to act in one’s own interest.”¹³ The professors of the CIA class looked to object-based learning as a way to confront this challenge.

Object-based learning

Object-based learning refers to the “role of objects in the acquisition and dissemination of subject-specific and cross-disciplinary knowledge, observational, practical and other transferable skills”.¹⁴ The act engaging with an object through our senses “has the potential to initiate long-term memory, concept associations and higher-order thinking”.¹⁵ Sensory engagement with objects can stimulate curiosity and ongoing interest in the subject, which has the potential to motivate learning.¹⁶

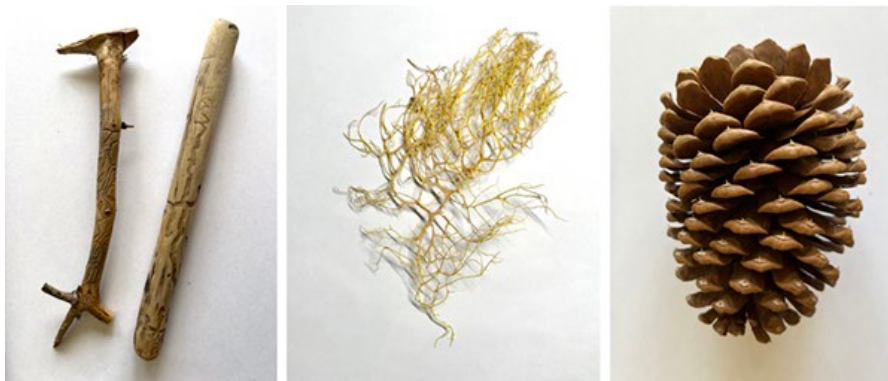


Figure 1. Examples of objects collected from the field campus for students to choose and work with. Left to Right: Sticks with bark beetle devastation, wolf lichen, Jeffrey Pine cone.

Furthermore, object-based learning is a way to “enhance engagement, empathy, understanding and knowledge for students.”¹⁷ The CIA class asks students to choose an object which becomes their subject of research for the duration of the class (fig.1). They must care for it, keep it safe, and bring it to every class—helping students understand the responsibility of caring for something other than themselves.”¹⁸

At the field campus students are also tasked with sample collection. This is another form of object-based learning. Students engage with the collected specimens by observing them through microscopes, visual analysis, and group discussion.

Object-based learning is an important aspect of this class. Our hope is that these close relationships with objects will help students adjust their values from egoistic to biospheric through empathy, curiosity, and interest built from object-based learning and experiential learning.

THE COURSE

Interdisciplinary Co-Teaching

The CIA class is interdisciplinary and co-taught by an expert in environmental politics (Professor Logan Hennessy) and an expert in graphic design (Professor Saskia van Kampen). Interdisciplinary co-taught courses are not easy to achieve in institutional bureaucracies, but they offer students multiple perspectives from alternate disciplines and individuals. Students learn how to incorporate information from alternate disciplines into their own field of study.¹⁹ This is done through listening to professors, engaging with materials, and peer-to-peer discussions. Research indicates that collaborative learning in co-teaching environments benefits students through higher achievement, greater retention, improved interpersonal skills, and an increase in regard for positive interdependence.²⁰

Faculty also benefit from the coteaching experience. Robinson and Schaible explain:

Collaborative teachers offer each other a much needed sounding board for sharing the excitements as well as the perplexities and disappointments of particular class sessions. They also develop, out of their common experience, the chance to engage in more philosophical explorations about teaching. Collaborative pedagogy holds much promise, but only if faculty members themselves can learn to become better collaborators.²¹

However, Letterman and Dugan warn that team teaching can be challenging to organize and it can take more time than teaching alone.²²

Structure

Climate Issues and Activism is a three-week summer-intensive class. The first week is spent on the university campus—class meets two times for three hours. During this week students are tasked with identifying their topic and doing preliminary research.

The second week is spent at a remote field campus with no access to the internet or any other digital resources. This week we spend every day together. Class starts at 8:00 am and ends at 8:00 pm.

The last week is spent back on campus meeting twice for three hours. The last class is for final presentations.

Preparation

The professors spent over a year preparing the course. Curriculum design was the greatest amount of work and used the pedagogical theories to create ways to accommodate the lack of digital access at the field campus. The professors built a course reader (fig.2) that explained overarching climate issues and design principles and introduced students to activists and activism. The reader was built to support the various topics that students were working with and the outcomes that students were expected to develop. It also had activities and exercises that would support Dewey's concerns about experiential learning activities—self-reflection prompts, observational activities, and other materials that would support experiential activities students would engage in. These materials helped to ground students experiences in learning outcomes by having them think about, analyze, and contextualize what they experienced. The course reader also included fun activities for down time at the camp—word searches, scavenger hunts, and coloring pages pertaining to climate issues and activism were added.



Figure 2. Course reader with student notes and exploration.

Experiencing the field campus prior to running the class was necessary in order to locate hiking trails that were aligned with the topics being covered and to collect items that we would use for the object-based learning component of the course. We went in June which was serendipitous because there was still snow at 5500 feet—we would need to plan for a July semester to avoid snow.

Curriculum

Week 1

The first activity students engaged in was designed to give them insight into the active nature of the course and to illustrate what environmental activism can look. The activity, called Environmental Footprints, had students download an eco-footprint calculator. Everyone (professors and students) went through the app's prompts to calculate how their life habits impacted the earth. Once completed we took off our shoes, stepped in paint, and made a print of our foot on a large sheet of paper. Beside the footprint we added our initials and the results from the app—essentially we built an infographic (fig.3). We hung the poster in the school hallway with a QR code to the ecofootprint calculator so that those who walked by could also participate—a form of environmental activism. This activity was awkward and messy and immediately exposed how our lifestyles affect the environment. It used social constructivist and experiential learning theories to break down social barriers.



Figure 3. Icebreaker activity called environmental footprints encouraged students to socialize, work together and demonstrated what activism can look like.

The next activity had students engage with the objects gathered from the field campus. Students could pick the objects up and ask questions about them. They then had to choose one item that would be their subject for the remainder of the class. For example, if a student chose a pine cone their subject could be logging, forest fires, the effect of climate change on a specific tree population, etc....

Knowing that students would be without internet access for the second week of class we tasked students with finding research materials. They were to be to either be downloaded onto their computer or printed out so that they could access them at the camp.

Week 2 – at the camp

The mornings at the camp are run by the environmental expert. He explains local climate issues during hikes and students gather samples and work with reference guides to identify species of flora and fauna. Students saw abandoned mines, burn sites, areas of bug infestation, and logging first hand (fig.4). A student participant explained that “being in the field and seeing what is happening first hand was super powerful.”



Figure 4. Collecting samples from a stream and witnessing forest fire devastation first hand.

The afternoons were spent in our classroom—a large tent. I worked with students to develop advocacy campaigns grounded in their field research. Some of this entailed working with natural materials—exploring mark making (fig.5) and finding ways to make data more visually engaging.



Figure 5. Student exploring rubbing technique using crayon on bark beetle devastation.

One key activity was the group ideation sessions. Each student explained their subject and research findings. The group helped each other locate target audience, key stakeholders, and call to actions by walking through a series of prompts in the course reader. We then ideated on potential outcomes to bring about change. These conversations were documented on paper (fig.6) and were lively with lots of laughter and camaraderie. One student participant stated:

I really enjoyed the ideation process with lots of different people. It made me think more broadly about the impact my outcome could have. It also strengthened my idea of what is an effective designed thing.



Figure 6. Compiled group ideation notes for student studying lichen.

Students were given some down time in the afternoons when it was really hot. They were able to engage with the course reader, study the resources they brought with them, go swimming, or simply have some time alone. Art supplies were available to them to explore. Without their cell phones students relied on each other for company. Students could be spotted sitting together working on the course reader or engaging in play activities. This may seem insignificant, but for a commuter campus, where student relationships are tenuous, this was truly delightful to witness.

In the evenings we would examine collected specimens through microscopes, discuss plans for the following day, read aloud from the reader, write reflectively about the days' activities, and would end up sitting around a campfire or going for a night hike. Afterwards, the students usually stayed up playing cards in the dining hall.

Week 3

The final week had students engage in peer feedback on outcomes and final presentations of their climate activism outcome

FRUSTRATIONS AND LESSONS LEARNED

Frustrations

Data from a 2024 student survey show that most of our students work between ten to twenty hours a week to earn money for school and living expenses. When asked what they wanted most post-graduation, their top response was: "get a job, any job, I need to make money." This class has to run in the summer as the field campus is not accessible in the winter. Summer intensive classes are already challenging for students—they are not an ideal learning model for some individuals as they compress a semester into a few weeks. Summer is also when students dedicate themselves to their paid jobs, earning the bulk of their money for the year. Summer classes at SFSU are expensive (students pay for every class they register for). The field campus has the added cost of food and board. The CIA class also requires the students to take off a full week of work to be at the field campus. Because of these issues only one student registered the first year that we offered the course.

The second year we reduced the class from six weeks to four weeks, but still, not enough students registered to run the class.

This past summer we reduced the class to three weeks, accounting for the hours spent teaching during the full week at the camp. We had six students register—just enough for us to run it.

Faculty payment is through the field campus and payment is based solely on number of students registered. The course does not have the budget to pay two teachers. We had to split the salary.

Lessons Learned

Students were not prepared with readings and research prior to leaving technology behind. They were warned that they would not have access to the internet, but they did not seem to understand what this would look like. We need to articulate more clearly what "no access" to the internet means.

Making the class three weeks helps students with their lives outside of school, but it is too short. Students did not have time to finalize their outcomes. Most students had very rough concept sketches completed by the presentation date. Their ideas were good, but the design students were disappointed that they did not have a refined portfolio piece at the end of it.

We also need to add a warning to the course description about the strenuousness of the hiking. We had one student who had asthma—the altitude combined with the moderately challenging hikes became a problem for this student.

CONCLUSION

This course demonstrates how intentionally removing digital access, when paired with carefully designed pedagogy, can deepen learning rather than limit it. By grounding the Climate Issues and Activism course in social constructivism, experiential learning, value theory, and object-based learning, the professors created conditions where students were required to slow down, observe closely, collaborate meaningfully, and generate knowledge from lived experience. Direct engagement

with place, objects, and each other became the primary research method, allowing students to develop advocacy campaigns rooted in empathy and firsthand understanding.

The field campus experience was central to this process. Seeing ecological damage, collecting samples, caring for objects, and reflecting together created a continuous chain of experiences that reinforced learning across cognitive, emotional, and social domains. Without screens or on-demand information, students relied on conversation, shared problem-solving, and imagination. This shift not supported creative ideation and fostered collaboration, mutual accountability, and a sense of collective purpose, which are increasingly difficult to cultivate in digitally saturated learning environments. In this way, the course supports existing research suggesting that experiential, place-based education can contribute to lasting shifts in perception and values.

At the same time, the course had significant structural challenges that impacted the accessibility of the class, which may be similar in other immersive, analogue-based courses. Financial barriers, scheduling constraints, physical demands, and the compressed nature of the class shape who is able to participate and what students can ultimately produce. The lessons learned underscore the need for the faculty to create clearer student preparation and more realistic expectations around outcomes. But it also lays bare the struggles of students and the need for institutional support for interdisciplinary, labor-intensive teaching models as well as federal support for education.

Despite these limitations, the Climate Issues and Activism course offers a compelling case for rethinking the role of technology, place, and material engagement in higher education. It suggests that carefully designed constraints can act not as pedagogical liabilities, but as generative forces—creating space for deeper learning, relational knowing, and value formation. As climate education and design education increasingly seek meaningful modes of engagement, this model points toward the pedagogical potential of learning environments that privilege experience, empathy, collective inquiry, and a slower more deliberate process.

NOTES

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- ² Vygotsky, 73.
- ³ David A. Kolb, *Experiential learning: Experience as the source of learning and development*,. (New Jersey: Prentice-Hall, 1984), 41.
- ⁴ Alice Y. Kolb and David A. Kolb, "Learning Styles and Learning Spaces: Enhancing Experiential Learning in Higher Education," *Academy of Management Learning & Education*, 4, no. 2 (2005): 194.
- ⁵ John Dewey, *Experience and Education*, (New York: Free Press, 1938): 27.
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- ²⁰ Letterman and Dugan, 58.
- ²¹ Betty Robinson and Robert M. Schaible, "Collaborative teaching: Reaping the benefits," *College Teaching* 43, no. 2 (1995): 59.
- ²² Letterman and Dugan, "Team teaching," 77.

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A CASE STUDY IN CONVERSATIONS

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INTRODUCTION

This paper presents *a case study in conversations*. It describes the power of building relationships that create what Jane Rendell would term a *situation*¹: a time and space that illuminate new possibilities in familiar circumstances. In this case, the *situation* is an international scholar's visit - Professor Jane Wolff's from the University of Toronto- to the Faculty of Architecture Building and Planning (ABP), in Melbourne where Kelum, Fiona, Pip and Sarah are located.² The visit, organized strategically and tactically, catalysed a reconfiguration of disciplinary relationships within the school in the moment, and in the longer-term thinking of participants. The relationships that made this situation possible emerged from investments of time, energy, and ongoing (if intermittent) conversation: what Anishinaabe scholar Jennifer Wemigwans refers to as "many cups of tea."³ In our case, the cups of tea were metaphorical. Located on opposite sides of the world, we met over Zoom at the 2020 AMPS conference and kept talking—and sharing work—over the next several years as Kelum mobilized resources for a visit. Why is this useful? It's an example of cross-disciplinary collaboration that works interstitially, without demanding institutional-scale change—and that works efficiently, without demanding a large budget. We see it as a case study in navigating two challenges in tertiary education in Australia and Canada (and we surmise, in many other places): one, the Balkanization or siloing of programs within faculties of design (and more broadly, in many professional degrees); and the other, constant (and growing) funding limits. Because of the work to build relationships in advance *and* because of the work to think deliberately about the visit as a *situation*, a small budget was able to produce an expansive cross-disciplinary conversation.

Critical to how the visit unfolded was the shifting funding landscape within which we operated. Government funding of university research in Australia is increasingly geared towards strategic - but narrowly defined - national interests which then shape the major research funding schemes and smaller seed funds within universities.⁴ There appears to be less room for exploratory projects particularly ones outside of those strategic strands. And so, the visit quickly became about the mobilization of modest funds and the leveraging of those funds for meaningful impact.

Another structural condition the visit addressed was the silo-ing or the Balkanisation of programmes in design schools. It is a well understood phenomenon particularly in professional courses seeking to support specialisations.⁵ While there is scholarly debate for and against this tendency,⁶ the danger we see is the development of what Raewyn Connell terms as 'the hegemonic curriculum.' Connell's thesis refers to curriculum in research universities more broadly where they absorb and uphold hegemonic conditions in society. In the same way, ontological and epistemological approaches of a

particular disciplines can stabilize over time and become as Connell describes, “...orderly, closed, and full of answered questions.”⁷ Through Jane’s visit we aimed to foster space and time for conversations that have cross-disciplinary relevance – as Rendell writes, to differently configure existing relationships. She argues that this reconfiguring of relationships and constructing *situations* in order to “...provoke critical awareness”⁸ is akin to a critical spatial practice.⁹

To frame and interpret the visit, we draw on Rendell’s theorisation of *sites*, *situations* and *situatedness* where Rendell writes, “If a site is a location that can be defined in physical and material terms, a situation can be both spatial and temporal, the location of something in space and the set of circumstances bounded in time - the conditions of a particular instant, a moment, an event.”¹⁰ We frame Jane’s visit to the ABP as such a ‘situation’, suggesting a teaching and engagement model where a visitor to the school can be ‘inserted’ (spatially, temporally, and through curricula) into the structure of a school without altering/displacing the existing institutional structure to produce a different set of conversations/connections across programmes and year levels.

Following Rendell’s description of *situatedness* as, “...a way of engaging with the qualities of these processes of situating or being situated,”¹¹ in the following sections we consider our situated engagement in spatiality, temporality and curriculum as we consider the making, enactment, and the aftermath.

To communicate a sense of the diversity of encounters, the multiple ways the visit was recorded, the insights from the conversations, as well as the actors involved in the visit, we began building a diagram on Miro. Again, drawing on Rendell’s work, it became a synchronic diagram,¹² one that maps spatial relationality as well as a temporal sensibility. The key axes of temporality and spatiality have multiple nested scales which becomes evident as one zoom in and out in the diagram (Access map here: https://miro.com/app/board/uXjVJxjRfHM=?share_link_id=139721697729)

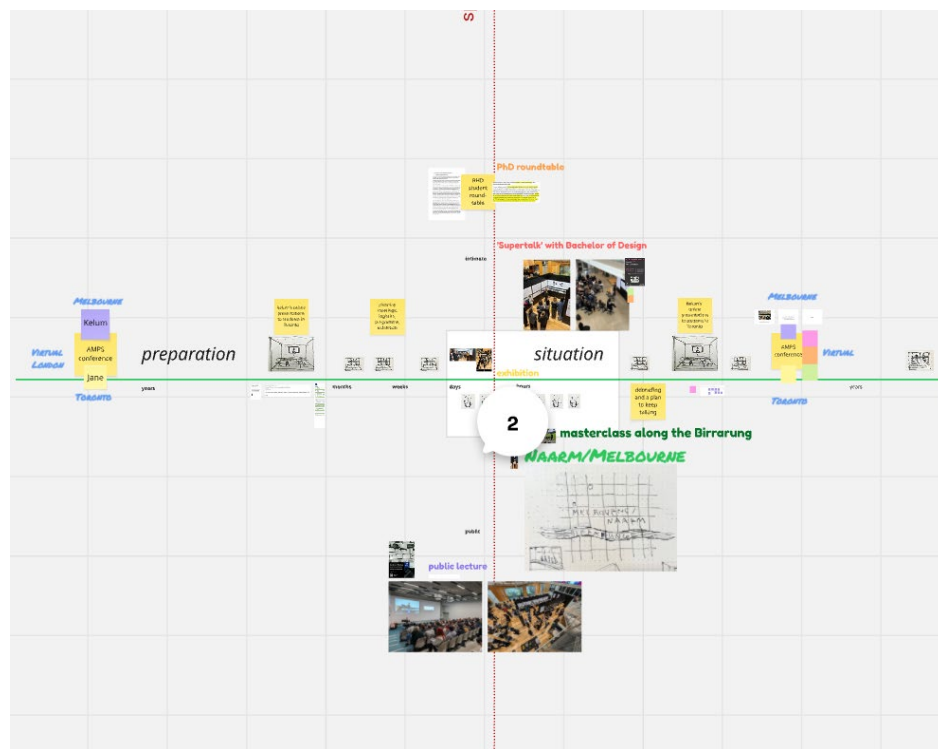


Figure 1. The open and unfinished synchronic diagram on Miro to which we can keep adding as conversations continue. Access:

https://miro.com/app/board/uXjVJxjRfHM=?share_link_id=139721697729

THE MAKING

Here we discuss the making of the *situation* over the temporal span of years, building into a half year of intense preparation. Spatially, all conversation at this stage occurred across the non-space of the internet through Zoom meetings, emails and telephone calls.

From the 2020 meeting at AMPS, Jane invited Kelum to speak to her students in Toronto via Zoom, a talk which she reprised in subsequent years. They learn more about each other's work and discover shared interests in ethnographic work as a foundation for design as well as a shared love for drawing to communicate ideas.¹³ Kelum became aware of a seed fund offered at the University of Melbourne that encouraged overseas collaboration through a visit and invited Jane to discuss her research. It was a sum of 5000 AUD won in a competitive round of 56 applicants with 15 successful proposals for the funding— a success rate of 27%.

In 2024, with eight months to the visit, we began to plan the visit in detail and increasing intensity. Our aim was to include an exhibition of Jane's work, a masterclass with graduate students, a public lecture, and facilitate open conversations with students at different levels including undergraduate, graduate and research higher degree. Our conversations on matters of spending and logistics were inflected by our modest budget, and so we aimed to plug into, and piggyback on the well supported and established faculty services, research events and teaching programmes as much as possible – to slip into the machinery.

Conversations ensued with multiple professional support teams within the schools and across schools guided by the ABP Strategic Events Coordinator and the Associate Dean of Engagement to organise flights, visas, accommodation, venues, catering, as well as publicising the visit. It was important to avoid clashes in a packed, year-long programme that would have been years in the making. The university has a far-reaching dissemination system for major public events which we could not access because it required around 2 years notice. Conversations with the Events team led to the decision to publicise the talk through social media channels, faculty level ephemera such as posters and notices, and online programmes like Event Brite instead. Meanwhile, conversations took place in Toronto with Jane and research assistants (Nick and Orly) to design the exhibition, and files were transferred digitally across borders for plotting and setting up.



Figure 1. The exhibition and public talk relied on social media to advertise key events. It was more agile and accessible than formal dissemination routes.

A key aim was to anchor Jane's visit in curricula – conversations with colleagues across the Architecture, and Landscape Architecture programmes built on existing collegial relationships. It was decided to time the visit to coincide with Week 3 of the teaching semester when students will be engaged in inquiry and exploration and not distracted with assessments. We aimed to embed the week of engagement in existing semester activities and teaching material - this included a video introduction by Jane on methods for understanding site, added to existing resources in the subject LMS in order to scaffold students and prepare them for the organised masterclass. We worked together to identify sites and topics for the masterclass in a way that was relevant across both programmes. Undergraduate engagement was plugged into an existing series (SuperTalk) designed to encourage encounter between Faculty visitors and undergraduate students. Meanwhile interested PhD students got in touch with us to arrange a roundtable after seeing posters of the visit. In this way, pathways for conversations started to form that were both cross-disciplinary as well as transversal across year levels.

ENACTMENT

The enactment was across a compressed period of 5 working days in August 2024. This section will visit the daily, and at times hourly temporal scales of the visit as well as the spaces that anchored and spaces that shifted conversations between the intimate and public.¹⁴ See Miro diagram for further insights and photos.

Day 1: Jane, Fiona and Kelum engaged in a full day Masterclass with graduate Architecture and Landscape Architecture students which entailed an exercise in the field along the Birrarung¹⁵ (figure 2) followed by a sketch problem- the development of tools for engaging the landscape - returning to studio space in campus. The exhibition was open to contributions - a thing that was finished in collaboration with the school. The students' work was immediately added to the exhibition.



Figure 2. Field exercise along the Birrarung with Master of Architecture and Landscape Architecture students. Photo by Kelum Palipane.

Day 2: The public lecture was conducted in a formal lecture theatre at the school in the evening. The day - a Tuesday - is a temporal marker in the week, a day that traditionally visiting lectures are scheduled. Immediately after the lecture, attendees were invited to join the exhibition opening and conversations afterwards with Jane. The exhibition was situated in a central location in the school in a triple height atrium overlooked by studio and office spaces. The immediate shift from the expansive space of the lecture theatre to the relatively intimacy of the exhibition created a conducive environment for conversation.

Day 3: For Jane to have a sense of Melbourne and its contested history we suggested she explore the city of Melbourne, and that she participate in the self-guided Yalinguth¹⁶ tour of the Birrarung. The Yalinguth App is a First Nations audio app and tour that geo-locates stories on a trail along significant Aboriginal sites in Melbourne. This orientation spatially and historically in relation to the river was particularly relevant because of Jane's research work.

Day 4: The morning was spent in open conversations with PhD students in a small roundtable setting at the school. There was a sense of intimacy and intensity (see Miro diagram for insights by participants). The afternoon entailed conversations with undergraduate students in and around the exhibition space through a Supertalk session led by Pip and Sarah. The SuperTalk became another temporal marker of the week as the series is often held on a Thursday when most studios run.

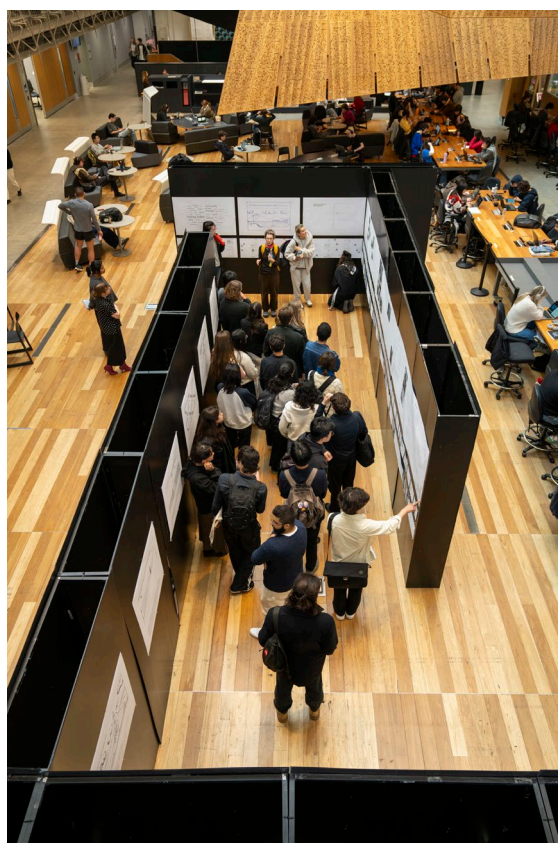


Figure 3. Conversations across the week were anchored by the exhibition. Photo by James Rafferty.

Day 5: The visit concluded with a debriefing between Jane and Kelum and an evening meeting with Melbourne landscape practitioners. This was made possible by existing relationships with industry that had been cultivated by the Associate Dean of Engagement. It meant a practice hosted Jane including the venue and catering.

Throughout the week the exhibition space became an intellectual and spatial focal point, mediating much of the conversation.

REFLECTIONS

In this section we reflect on what the visit offered, and to whom, how has it impacted our ideas about our own teaching in our own institutions and the echoes afterward.

Jane: *I think that because I was a stranger to Melbourne, the unfolding of our situation at plural spatial scales struck me powerfully, through a series of simultaneous and different senses of space*

and place. Our beginning point at the Birrarung juxtaposed the perceptual and proprioceptive experience of our bodies with a sense of the city that grew around the river. At the university, we inhabited an exhibition space that afforded a big enough place for a large public gathering and a small enough place for an intimate conversation with students; we met in a large lecture hall and a small seminar room that gave rise to conversations of equal intensity but different character; I found myself at a conference table in a design office where practitioners told me about large-scale plans for the Birrarung and its watershed; and I thought again and again about the scale of two teacups--and the scale of the Commonwealth, whose history has left Canada and Australia facing so many of the same post-colonial dilemmas.

Jane and Kelum: Some other insights and questions that have stayed with us and offer avenues for conversation going forward include, 1/The realization that a small insertion into big and stable structures—the curriculum, or the space of the school building, or the weekly schedule—can create ripples of connection across divisions established by discipline, by funding streams, by habit. It's a powerful realization because the situation didn't ask for change in the structures themselves. It didn't even disrupt the structures—the ripples moved within and among existing programmes, producing a new conversation without displacing what was already going on. 2/The observation that even over a few days we were able to build a constituency. People who came to more than one event, and relationships and discussions accumulated over the course of the week. They gained momentum and depth, and they also produced a sense of familiarity and conviviality—and from there, a sense of openness in the moment and possibility going forward. The choreography of the situation (in Rendell's sense) enabled the development of relationships for that week and also for the future. For people who don't control institutional resources, we think this is a powerful model. Why? because it required minimal funding to produce something that was both lively and enlivening.

Fiona: I remember observing throughout the masterclass the commitment of my cohort to the exercise. By serendipity, it was quite grounding for the studio, which wasn't siteless exactly, but a deep speculation to 2090 so the site itself was temporally distant. They were working in a site in the Birrarung catchment so there was a direct connection. I had felt in the aftermath that it helped ground their designs in a tangible, material sense to site - to attend to texture and atmosphere. It also addressed a gap that I hadn't really noticed – in that I hadn't factored in any physical modelling as a technique, so it also gave the students an experience of shifting modes that was useful. The whole day acted as an ice breaker for design thinking – doing a charette that was uncoupled from the assessment enabled the students to begin thinking about both observation and translation through a very focused exercise.

In planning for Jane's visit, I did have some concerns about where the field trip fell in the semester. It was in some ways unavoidably disruptive, in that it fell halfway through an assignment cycle and probably disturbed one component of the assignment. This for the most part didn't impact on the outcome, which was a nice surprise. This does highlight something which emerged through this process – the tension in design studio teaching between allowing space for exploration, and densely programming sessions. Perhaps it might be better to think of this as slowing down as opposed to speeding up. The session reminded me that often we don't allow enough time and breathing space.

Pip: From a student perspective, having moderated the conversation with Jane and a group of undergraduate design students across multiple majors, the visit demonstrated the pedagogical value of situating an external scholar within the everyday life of the school. Having facilitated previous BDes discussions with visiting guests, I had rarely witnessed this level of anticipation, attendance, and sustained engagement. More typical formats - formal lectures followed by brief Q&A - often

produce a certain hierarchy: discussion gravitates toward academics, while students hesitate at the margins, particularly in open and highly visible spaces.

In contrast, Jane's insertion into the atrium exhibition - chairs gathered into a loose circle, movement through the work, conversation rather than presentation - fostered an atmosphere of inclusion and open exchange.

Inviting students across disciplines within the Bachelor of Design to prepare questions in advance extended the situation temporally and distributed ownership. By the time we gathered, conversation had already begun. Prepared and spontaneous questions intertwined, and students built upon one another's contributions, bridging perspectives across typically siloed disciplines. Participation was active and accessible, and noticeably broader than in previous guest events. As a student, it was rare to experience such collective momentum in the lead-up to a scholar's visit, or to see conversations seeded during that week continue to circulate through design studios and the wider student community in the weeks that followed.

Sarah: *A lasting memory of Jane's visit was the energy and enthusiasm our B.Des students brought to the SuperTalk. Holding an informal presentation within an active, central space with students working at nearby desks and moving past engaging only briefly, gave the talk a theatrical and performative feel that was quite different to more formal lecture. Jane walked us through the exhibition of her work, with the students gathered quite close, as if in a conversation – not being lectured to. The informality and sense of connection the presentation created, led to a lively panel discussion and questions from students to Jane that were overwhelmingly considered and optimistic. Reflecting on the students' questions, their responses to Jane's answers and the wider discussion later, it struck me that the students were very much connected to place and approach their design / projects through a multilayered understanding and appreciation of a unique site. Inviting Jane into their space emboldened the students and expanded their thinking but also reassured them. The contrast with recent events and discussions I had had with professionals practising in architecture, where the weight of history, context and environmental concerns of a particular place was felt heavily and as a negative, the depth and care of the approach to place the students discussed, and the positivity they brought to the prospect of fully understanding and responding to a particular place was uplifting.*

CONCLUSION

In this essay we presented a model for engagement and teaching in large design schools framed as a critical spatial practice that reconfigured existing disciplinary relationships through constructing a *situation*. We drew on Jane Rendell's theorisation of *sites*, *situations* and *situatedness*; where to *situate* is to position something in a particular place, a *situation* - which is both spatial and temporal - is the location of something in space and the set of circumstances bounded in time, and *situatedness* is being emplaced and engaged with the conditions of the situation. Considering Jane's visit to the ABP as a case study, the paper illustrated how a visiting scholar can be situated spatially, temporally and through curricula into the structure of the school without altering or displacing the existing to produce a different set of conversations and connections across programmes and year levels.

Key aspects we discussed are the spatiality of the *situation* which included an exhibition in a strategic place that facilitated and anchored conversations; the temporality of the *situation* through its positioning in the teaching semester and temporal markers across the visiting week that tied-in to existing teaching/research events and schedules; and *situatedness* in curricula across the Architecture and Landscape Architecture programmes, and transversally across year levels through engagement with research higher degree, masters and undergraduate students. We argue that the "choreographing

of situations” suggests a model of teaching and engagement in large design schools with potential to provoke critical awareness across programmes that are often hermetic and divided.

ACKNOWLEDGMENTS

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NOTES

¹ Jane Rendell, "Sites, Situations, and Other Kinds of Situatedness," *Expanding Modes of Practice*, Log 48 Spring/Summer (2020): 27-38.

² The ABP hosts a large undergraduate programme - the Bachelor of Design - with cognate Masters programmes including architecture and landscape architecture into which we teach. At the ABP, Kelum is a research and teaching staff member in the architecture programme while Fiona and Sarah are practitioner/teaching specialists in the landscape architecture and architecture programmes respectively. Pip was an undergraduate student in the architecture programme at the time of the visit and Jane is Professor in Landscape Architecture at the John H Daniels Faculty of Architecture Landscape and Design, Toronto.

³ Jennifer Wemigwans and Lanna MacKay. "The Haudenosaunee Ohén:ton Karihwatéhkwén Thanksgiving Address: Moving Beyond the Havoc of Land Acknowledgements." *Engaged Scholar Journal* 9, no.2 (2023): 1–21. <https://doi.org/10.15402/esj.v9i2.70829>

⁴ Ksenia Sawczak. "Latest government bid to dictate research directions builds on a decade of failure," *The Conversation*, December 17, 2021, <https://theconversation.com/latest-government-bid-to-dictate-research-directions-builds-on-a-decade-of-failure-173834>

⁵ Michael Anft, "Breaking Professional Schools Out of Their Silos," *The Chronicle of Higher Education*, April 30, 2017, <https://www.chronicle.com/article/breaking-professional-schools-out-of-their-silos/>

⁶ For a comprehensive analysis of the debate see, Jerry A. Jacobs, *In Defense of Disciplines: Interdisciplinarity and Specialization in the Research University*, (Chicago: University of Chicago Press 2013).

⁷ Raewyn Connell, *The Good University: What universities actually do and why it's time for radical change* (Bloomsbury Academic, 2022), 46.

⁸ Rendell, 34.

⁹ Rendell.

¹⁰ Rendell, 27.

¹¹ Rendell, 27.

¹² Rendell, 36-37.

¹³ See, Jane Wolff, *Bay Lexicon: A field guide to San Francisco's shoreline – past and present – and a lexicon for imagining its future*, (Montreal and Kingston: McGill-Queen's University Press 2021) and "Conversations at Kitsilano," Vancouver: UBC SALA, 2024. Anoma Pieris, and Kelum Palipane. "'Persistent' Migrant Kitchens: Spatial Analogies and the Politics of Sharing," *Australian Feminist Studies* 37 (112), 2021. 'Intersecting Mobilities: A Design Proposition -- Learning from Difference in an Uneven and Complex Public Sphere'. AMPS Proceedings Series 19.2. City, University of London, United Kingdom: AMPS.

¹⁴ Refer to Miro diagram for details: https://miro.com/app/board/uXjVJxjRfHM=/?share_link_id=139721697729

¹⁵ The Birrarung in Kulin language (with the colonial name of the Yarra River) is a culturally and historically significant waterway in Melbourne. "Reimagining Birrarung: Design Concepts for 2070," The Ian Potter Centre: NGV Australia, accessed 20 February, 2026. <https://www.ngv.vic.gov.au/exhibition/reimagining-birrarung/>

¹⁶ <https://www.yalinguth.com.au/>

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MAKING ART HISTORY MATTER: SITUATED AND EXPERIENTIAL LEARNING FOR NON-MAJORS

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INTRODUCTION

Art history courses in the general education curriculum often occupy an uneasy position. For non-majors, they are frequently perceived as content-heavy distribution requirements, valuable for cultural enrichment, perhaps, but disconnected from their academic trajectories or professional aspirations. This disconnect is amplified by two pressures shaping higher education today: on the one hand, the demand for demonstrable, transferable skills, and, on the other, the rise of generative AI tools capable of producing plausible visual analyses and reflective essays with minimal student engagement. In this context, traditional modes of teaching, including lectures, slide-based discussions, and decontextualized writing assignments rarely succeed in showing students why art history matters.

Experiential learning offers a compelling alternative. By reframing art history as active inquiry rather than passive absorption, it aligns with broader calls for engaged, practice-based education across the humanities. When students encounter art history as something they do – asking questions of artists, reading institutional settings, and making curatorial decisions with real consequences – the discipline becomes legible as a set of methods and literacies that travel beyond the classroom. This paper argues that art history becomes meaningful to non-majors when it is experienced as practice rather than merely studied as content.

Drawing on three case studies from courses taught at Webster University Geneva between 2019 and 2024, I outline a framework for practice-led pedagogy and examine its implications for general education art history in an era of generative AI. The cases – artist workshops and dialogues, fieldwork at the commercial art fair artgenève, and a student-led fundraising exhibition – are designed to foreground embodied, institutional, and civic literacies. Together, they demonstrate how situated experiences can produce rigorous learning and assessment while resisting the automation of student work.

THEORETICAL FRAMEWORK: ART HISTORY AS SITUATED PRACTICE

This paper approaches art history as a situated practice rather than a static body of knowledge. The design draws on John Dewey's insistence that education should be rooted in lived experience rather than passive information intake.¹ It also builds on David Kolb's claim that learning is not the acquisition of content but "the process whereby knowledge is created through the transformation of experience."² Recent work linking experiential learning to 4E cognition clarifies what counts as "concrete experience" in practice-led teaching: active engagement with physical and social surroundings.³

For non-majors, this practice-led orientation is particularly significant. Students from business, international relations, psychology, or computer science often view art history as ornamental or irrelevant. By drafting questions for an artist, negotiating pricing with a gallerist, or composing a sponsorship message, they encounter art history as a repertoire of transferable methods – observation, interpretation, ethical judgment, and audience-aware communication – rather than as isolated content. The rise of generative AI further underscores the need for situated practice. Decontextualized written assignments can increasingly be automated, but projects anchored in real encounters – an artist workshop on campus, a branding discussion at artgenève, or troubleshooting a technical failure during a live fundraiser – create learning moments that connect cognition to place, relationships, and material constraints. Scholarship on embodied teaching in higher education remains dispersed; as Hegna and Ørbæk observe, the field “appears fragmented, with limited discussion and knowledge-building across publications.”⁴ In response, the framework developed here links embodiment to concrete course design features and assessment practices, showing how bodily engagement, emotion, and interaction can be intentionally scaffolded in general education art history.

Care-centered pedagogy complements this experiential approach by creating conditions of trust and agency, ensuring that students feel safe to take intellectual and creative risks – an especially important consideration for non-majors who may feel vulnerable in unfamiliar artistic environments. By foregrounding safety and agency, projects invite students to experiment without fear of failure, transforming discomfort into a productive space for growth.

Embodied, affective, and relational dimensions of learning are central to this design. As Lotte Schilhab argues, bodily engagement shapes cognition.⁵ Students “think with their hands” when stitching eco-conscious messages, creating protest-inspired images, or painting intuitively under an artist’s guidance. These material practices are entangled with emotion and care: conversations with artists about the joys and challenges of making art invite vulnerability, excitement, and frustration into the learning process – feelings that become resources for reflection rather than distractions.

Finally, experiential art history extends into institutional and civic domains. At artgenève, students develop institutional and market literacy, learning to read the fair as a constructed environment where visibility and value are produced. Fenwick’s sociomaterial framing is useful here: materials and settings permit some actions while preventing others, shaping what becomes visible, discussable, and valued in spaces like an art fair.⁶ Drawing on Paulo Freire’s critical pedagogy,⁷ students adopt a questioning stance toward cultural spaces by analyzing booth design, price displays, sponsorship signage, and branding strategies. In the student-led fundraiser, they engage in project-based civic learning, negotiating logistical challenges and ethical questions while mobilizing art for social impact.

COURSE DESIGN AND SOURCES OF EVIDENCE

The three case studies reported here were developed within general education art history and art appreciation courses taught at Webster University Geneva between 2019 and 2024. The pedagogical aim across contexts was consistent: to move students from passive reception to active participation by assigning authentic responsibilities and embedding structured reflection throughout each project. Evidence for the analysis comes from course artifacts (assignment prompts, maps and photographs produced during fieldwork, event materials, and student-produced portfolios), as well as in-class debrief conversations and peer feedback exchanges. Rather than treating reflection as an optional add-on, each case uses guided prompts and iterative cycles of feedback that ask students to: (1) document what they did and observed; (2) identify moments of uncertainty, surprise, or constraint; (3) connect those moments to course concepts; and (4) articulate what they would change in a future iteration. These prompts operationalize reflective practice as a mechanism that links experience, feedback, and future action.

This design draws on research emphasizing reflection as an intentional pedagogical mechanism that can be embedded within experiential learning curricula.⁸ It also aligns with accounts of metacognitive reflection as a form of “critical revisiting” of one’s thinking and action—acknowledging mistakes and limitations while tracing connections across experiences and concepts.⁹ In practice, metacognition was cultivated through reflective portfolios submitted after each experiential component, post-event debrief questions that surfaced decision points and ethical tensions, and short peer-feedback loops that invited students to compare interpretations and revise their accounts of what mattered in the experience.

CASE STUDIES: EXPERIENTIAL ART HISTORY IN PRACTICE

The case studies illustrate how art history courses can operate as laboratories for embodied, institutional, and civic engagement, transforming the discipline from abstract content into dynamic practice. Each project was designed to move students beyond passive reception of information and into roles that demand agency, collaboration, and critical inquiry. By situating learning in real-world contexts, these experiences position art history as an active mode of investigation rather than a static canon.

Meet the Artist: Embodied and Relational Learning

Meet the Artist foregrounded embodied and relational learning as central to understanding art history. Conceived as an experiment in extending the classroom beyond slides and readings, the series grew into a sustained platform for student-artist interaction, encompassing more than seventy events between 2018 and 2023. Students researched each artist’s work, drafted questions, shaped event formats, and wrote follow-up reflections, acting not only as audience members but as co-designers of shared learning experiences.

Workshops emphasized material engagement. In a session led by Icelandic artist Ásthildur Jónsdóttir (Spring 2019), students developed environmental slogans that were later “embroidered and exhibited in the woods surrounding the university,” experiencing artistic labor as a form of “transformative learning and active engagement.”¹⁰

A virtual workshop with the artist Rodrigo Figueredo (Fall 2021) shifted attention to art and activism: while the artist discussed social justice in his native Venezuela, students created protest-inspired images on themes such as war and climate change, discovering that clarity of message and honesty of feeling mattered more than technical mastery.



Figures 1 and 2. Rodrigo Figueredo conducting a virtual art workshop about art as a tool of political engagement and social commentary, fall 2021 (left); students’ artworks (right).

Geneva-based artist Ariane Tsai-Tse Sudan (Spring 2022) encouraged intuitive painting, inviting joy and play into academic space. Across these encounters, students repeatedly described relief at “thinking with my hands instead of overthinking with my head,” signaling a shift from art history as abstract knowledge to art history as lived experience.

These workshops demonstrate how embodied and relational learning can cultivate attention, empathy, and self-reflection – capacities that are difficult to achieve through lectures alone. They also develop interpersonal skills such as active listening, collaborative planning, and role negotiation, as students share responsibility for hosting artists and facilitating discussion. As assessments, the resulting reflections are anchored in specific interactions and material processes, making them resistant to generic, decontextualized AI-generated responses.

Artgenève: Navigating the Contemporary Art Ecosystem

The second case study moved students into a complex institutional environment and introduced them to the contemporary art ecosystem. For many non-majors, artgenève was a first encounter with a space populated by galleries, sponsors, collectors, and public institutions. To make the fair legible, students completed a gamified “picture challenge,” navigating booths with a map and camera, responding to prompts, and submitting photographs with short interpretive notes.

What appeared playful functioned as a structured introduction to institutional and market literacies. Tasks guided students through public collections and non-commercial entities before immersing them in blue-chip and mega-gallery contexts. Students documented booth design, sponsorship signage, and pricing, and were explicitly instructed to ask about the cost of a work at Hauser & Wirth. Back in class, these empirical traces became analytic objects: students reconstructed their paths, compared institutional framing, and examined how visibility and value are produced.

The assignment cultivated three interrelated forms of literacy: institutional literacy (distinguishing public and commercial actors and their agendas), market literacy (recognizing sponsorship, pricing, and branding structures), and critical visual literacy (connecting materials and techniques to descriptive vocabulary). Because the work depends on physical presence and interaction, it generates situated evidence, such as maps, photographs, and conversations, which supports robust interpretation while making superficial or fully automated responses easier to detect.

The Unseen: Curating for Civic Action

The third case study extended experiential learning into civic and project-based domains. Organized during Webster’s Creativity and Innovation Week, The Unseen was conceived and realized by students as a fundraiser for Ek Ek Paila, a Nepal-based charity funding eye surgeries. Students assumed distributed responsibilities: curating works, designing a digital catalog, producing marketing materials, managing logistics, and hosting the event. They negotiated spatial design, handled technical setup, and adapted to unexpected challenges such as relocating works for safety or troubleshooting equipment minutes before opening.

Pedagogically, the project functioned as service learning embedded within an art history course. Students connected visual concepts to the fundraiser’s theme, reflected on transnational inequality, and analyzed their roles in written portfolios. Emotions—pride, anxiety, solidarity—emerged as integral to learning, reinforcing the argument that affect is not incidental but central to care-centered pedagogy. By mobilizing art for social impact, students practiced civic literacy alongside curatorial and institutional literacies, discovering that art history can intersect with ethical and collaborative action.

As an assessment environment, the fundraiser produced time-stamped evidence of decision-making under pressure – communications artifacts, installation plans, and reflective accounts of constraints

and ethical choices. These features support evaluation of collaboration, leadership, and adaptive problem-solving in ways that are difficult to reproduce through decontextualized text generation.

DISCUSSION AND CONCLUSION

Across these cases, students experienced art history not as a static list of movements and dates but as a set of roles and practices. They acted as hosts and interlocutors in *Meet the Artist*, field researchers at *artgenève*, and curators and fundraisers in *The Unseen*. For non-majors, these roles reframed art history as relevant to project work in business, NGOs, communications, psychology, or event management. Each assignment shared a common design logic: authentic responsibilities, learning anchored in specific encounters, and reflection integrated into the process rather than treated as optional.

This logic can be distilled into three design principles that are transferable to other general education humanities contexts. First, assign students public-facing roles that require interaction with real people and institutions; authenticity generates investment and produces traceable evidence of participation. Second, ground interpretive work in material and spatial constraints – objects, settings, technologies, and time pressure – so that interpretation emerges from situated observation rather than abstract summary. Third, scaffold metacognitive reflection through iterative prompts, debriefs, and peer feedback so that students learn to articulate not only what they think, but how their thinking changed and why.

These approaches are not without constraints. Experiential projects require institutional support, careful planning, and attention to accessibility (financial, physical, and psychological). They also require transparency about assessment criteria and the cultivation of classroom trust, particularly when students enter unfamiliar cultural spaces. Nevertheless, the cases suggest that experiential art history offers a pragmatic response to both calls for employability-oriented skill development and the pedagogical challenges posed by generative AI. By designing tasks that depend on embodied presence, interpersonal exchange, and situated evidence, educators can preserve the distinctiveness of humanities learning while expanding its relevance for students beyond the arts.

In sum, practice-led course designs can make art history matter for non-majors by turning the discipline into a laboratory for embodied attention, institutional critique, and civic action. Rather than competing with AI on the terrain of decontextualized writing, experiential art history shifts assessment toward situated inquiry—work that is at once more difficult to automate and more valuable for students' intellectual and professional lives.

NOTES

1. John Dewey, *Experience and Education* (New York: Macmillan, 1938).
2. David Kolb, *Experiential Learning: Experience as the Source of Learning and Development* (Englewood Cliffs, NJ: Prentice Hall, 1984), 38.
3. Angélique Lebert and Óscar Vilarroya, "The Links between Experiential Learning and 4E Cognition," *Annals of the New York Academy of Sciences* 1541, no. 1 (2024): 37–52, <https://doi.org/10.1111/nyas.15238>.
4. Hilde Margrethe Hegna and Trine Ørbæk, "Traces of Embodied Teaching and Learning: A Review of Empirical Studies in Higher Education," *Teaching in Higher Education* 29, no. 2 (2024): 420–441, <https://doi.org/10.1080/13562517.2021.1989582>.
5. Lotte Schilhab, "Embodied Cognition in Art Learning," *Journal of Aesthetic Education* 58, no. 2 (2024): 33–45.
6. Tara Fenwick, "Sociomateriality and Learning: A Critical Approach," in *The SAGE Handbook of Learning*, ed. David Scott and Eleanore Hargreaves (London: SAGE, 2015), 83–93.
7. Paulo Freire, *Pedagogy of the Oppressed* (New York: Continuum, 1970).
8. Wing W.Y. Ho and Yan H.Y. Lau, "Role of Reflective Practice and Metacognitive Awareness in the Relationship between Experiential Learning and Positive Mirror Effects: A Serial Mediation Model," *Teaching and Teacher Education* 157 (2025): 104947, <https://doi.org/10.1016/j.tate.2025.104947>.
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FROM STUDYING ANCIENT SYRIA TO THE BROOKLYN BRIDGE: HELPING OUR STUDENTS BUILD CRITICAL SKILLS WITH CLIOVIS

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INTRODUCTION

Digital tools now saturate undergraduate classrooms, yet their pedagogical value depends less on novelty than on how effectively they scaffold historical thinking, interdisciplinary dialogue, and higher-order learning. This article examines ClioVis (<https://cliovis.com/>),¹ a digital timeline, mapping, and network visualization platform designed to support project-based learning by making students' analytical processes visible, collaborative, and assessable. Drawing on classroom implementations at the University of Texas at Austin and the University of Houston, we argue that ClioVis functions as an external cognitive scaffold that embeds core elements of Bloom's Taxonomy directly into student workflow, guiding learners from foundational comprehension to evaluation and synthesis. Through a detailed case study centered on the Brooklyn Bridge and a series of additional applications spanning modern infrastructure, Roman history, and ancient Syria, the article demonstrates how structured, chronologically ordered network maps can foster critical thinking, interdisciplinary literacy, and ethical reflection in both survey and upper-level courses. In an era of increasing reliance on generative AI and surface-level knowledge production, ClioVis offers a model for digital pedagogy that slows student cognition, foregrounds evidence-based reasoning, and reinforces the interpretive practices at the heart of historical inquiry.

ClioVis and pedagogical design

Dr. Bsumek's team designed ClioVis to simplify the processes of historical inquiry and make learning a more engaging process for students. In the platform, students construct evidence-based timelines composed of individual nodes. Each node represents an event, text, person, or technology. Each node also requires a date, a description written in the student's own words, and clearly identified primary or secondary sources. Students may embed images, videos, or even audio narration, but the inclusion of these elements is meant to enhance their own understanding of what they are studying. As Dr. Lindsay Passenger Weick noted in her review of the platform in *Teaching History: A Journal of Methods*, "The timeline tool provides multiple ways to teach with chronology and deepen students' historical knowledge."²

One of ClioVis's defining pedagogical features is that it enables students to directly connect specific event nodes. Student-made connections can be causal, thematic, or contextual, depending on the

assignment. Chronology, therefore, begins to function as part of a larger analytical framework rather than a neutral backdrop. This structure allows students to visualize continuity, turning points, and change over time and helps them better understand long-term processes through various lenses (depending on the historical methodology being employed). It makes their reasoning obvious to their peers, teaching assistants, and instructors. Timelines can then be viewed in their dynamic format in a Learning Management System (LMS) or on the Webapp or exported in a variety of formats such as URLs, CSV, Word documents, or HTML.

The design of the platform embeds some of the core features found in Bloom's Taxonomy directly into student workflow.³ For instance, foundational tasks such as identifying events and summarizing sources correspond to remembering and understanding. Organizing events into eras and determining relevance requires application and analysis. Connection-building demands evaluation, as students must justify claims of influence or causation. The completed timeline represents creation, an original synthesis expressed through a visual and textual argument.

INTERDISCIPLINARY LEARNING IN PRACTICE

At the University of Texas at Austin, Dr. Bsumek uses ClioVis in large survey classes due to its particular effectiveness in interdisciplinary courses. The tool provides these students, who hail from all different majors across campus, with a shared analytical language grounded in time and causation. For instance, students in Dr. Bsumek's "Building America: Engineering, Society, and Culture, 1865-1980" are engineering, history, art, economics, philosophy, math, and political science majors – to name just a few disciplines. Students collaborate on semester-long projects examining different aspects of American infrastructure. These students bring different assumptions about evidence, explanation, and significance into the classroom and are therefore primed to learn from each other if knowledge of their discipline can be leveraged in the class.⁴

Dr. Bsumek uses ClioVis for a group project and requires students to situate course materials and outside research within a shared timeline and network. The collaborative platform moves students beyond a parallel research experience. As a group, students must justify why an event belongs where it does, why it matters, and how it connects to other developments. Disciplinary assumptions become explicit and contestable, pushing students toward the evaluative and creative levels of Bloom's Taxonomy.⁵

Case study: the Brooklyn Bridge assignment

The Brooklyn Bridge assignment serves as the central case study for understanding how ClioVis functions in the classroom. Students work in groups of five and collectively identify a project, individual, or idea that influenced the construction of the bridge.⁶ Once they identify the factors that led to the bridge's construction, they create timelines comprising approximately 20 events explaining how their research topic influenced the construction of the bridge and American history. Events are then organized into historical eras and tagged with interpretive categories. Students reference evidence when making their notes and articulate additional evidence-based connections. Each group develops a thesis explaining why its chosen focus matters to the history of the bridge.

One student group, for instance, focused on the philosophical foundations of bridge designer, John A. Roebling, and his engineering practice.⁷ In order to create a timeline of events related to *ideas* and *infrastructure*, their first events start in ancient Greece with Aristotle's concept of *techne*, and not with the construction of the bridge in 1869. They thus began to frame engineering as a rational and moral form of *making* (see link to full timeline in figure 1). From there, students traced the development of natural philosophy through the ideas of Francis Bacon, emphasizing his insistence that scientific knowledge should serve the public good (Figure 1). Students then incorporated

Immanuel Kant's critique of empiricism and G. W. F. Hegel's philosophy of natural law into the timeline. Prior to actually building the timeline, students in this group needed to debate and track how abstract philosophical ideas made their way into educational institutions and, by extension, professional norms. In the student work within the timeline, we see them explicitly connecting Hegel's Berlin lectures to Roebling's education at the National Building Academy, arguing that philosophical training shaped his understanding of freedom, reason, and social responsibility (Figure 2).

As students researched and traced events from Europe to the United States, they analyzed Roebling's decision to immigrate as both an intellectual and an economic one. Roebling's letters, written after his arrival in the United States, were used to demonstrate how his philosophical commitments aligned with beliefs in self-determination and progress. Students then connected these ideas to his invention and patenting of wire rope, framing it not as inevitable technological progress but as an ethically informed intervention. This is exactly the kind of higher-level, critical thinking that can be difficult for students to achieve in a large lecture class.

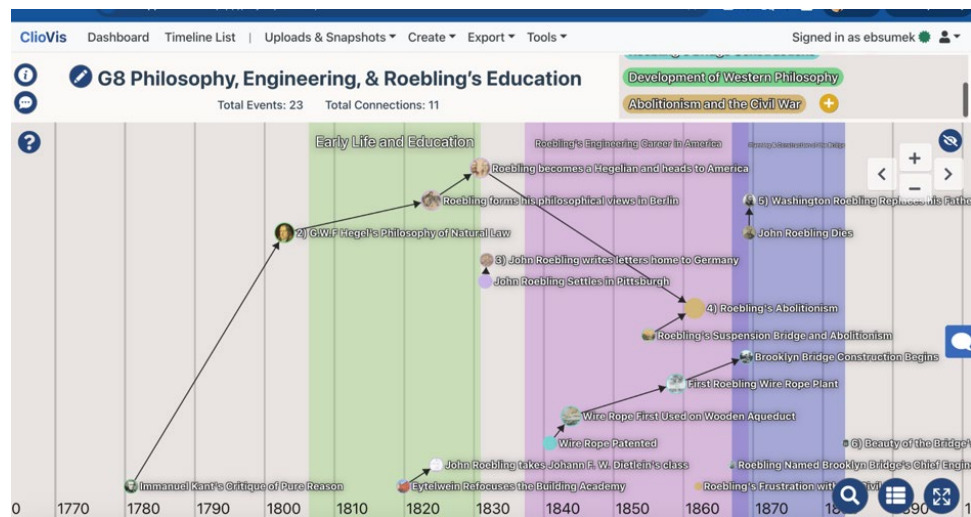


Figure 1. Screenshot of the full timeline in ClioVis. You can see the full timeline [here](#).

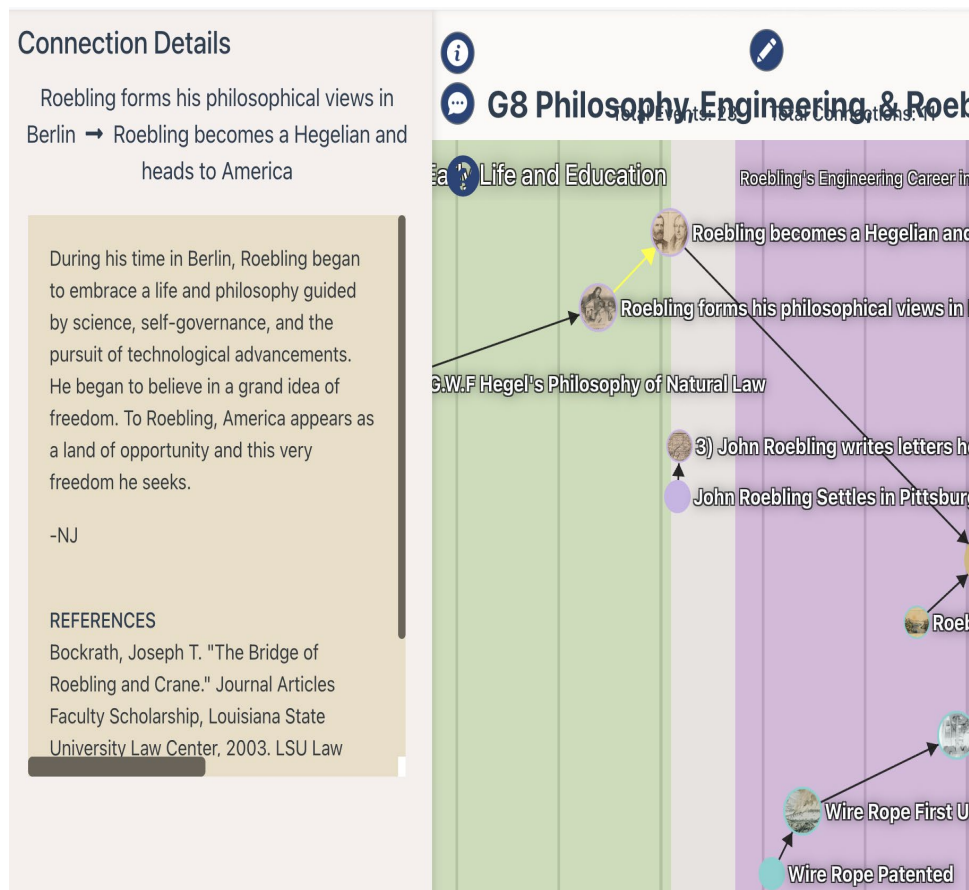


Figure 2. Screenshot of connection details between two event nodes with an explanation from the students.

The group also traced Roebling's engineering career through early suspension aqueducts, the establishment of his wire rope plant (noted above), and his increasingly ambitious bridge projects. One set of nodes examined the relationship between Roebling's abolitionist beliefs and the Niagara Railroad Suspension Bridge, which, students discovered, aided enslaved people as they traveled on the Underground Railroad to flee to Canada. These connections reinforced the argument that infrastructure is embedded within social and moral systems.

The final era of the project focused on the Brooklyn Bridge itself, including Roebling's role as chief engineer, his death, and the project's continuation under Washington Roebling and Emily Warren Roebling. Students argued that the bridge represented the culmination of Roebling's philosophical, technical, and ethical commitments, while also highlighting continuity across generations of engineering practice, even though he did not finish it.

What students actually did

From a pedagogical perspective, what matters is not simply the content students produced but the process they followed. Students conducted sustained research using primary and secondary sources (peer-reviewed articles, class readings, and primary sources such as Roebling's letters). They then paraphrased evidence, debated interpretation, and revised timelines iteratively. Disagreements were common and productive. Students argued about whether philosophical ideas constituted direct influence or broader intellectual context, revising connections as their reasoning evolved.

ClioVis made these debates visible. Since each node and connection was attributed to a specific student, the teaching assistants and Dr. Bsumek could then assess both individual contributions while

evaluating the coherence of the group's collective argument. The visual structure of the timeline reveals gaps in reasoning as students build it, prompting them to make corrections and conduct further research. Overall, the group's critical thinking skills developed throughout the work they conducted while working on the project and were informed by a shared analytical framework, approaches that have been shown to enhance student outcomes.⁸

Research on project-based learning has long suggested that such sustained, collaborative inquiry promotes deeper understanding than traditional assignments. By functioning as an external cognitive scaffold, ClioVis supports higher-order reasoning and interdisciplinary synthesis.⁹ These kinds of strategies will become increasingly important in the Age of AI because they push students to think, write, construct, and communicate – essential 21st century skills.¹⁰

CASE STUDIES FROM THE UNIVERSITY OF HOUSTON

While the Brooklyn Bridge project illustrates how ClioVis supports interdisciplinary inquiry in a modern infrastructure course, similar pedagogical benefits emerge in courses focused on the ancient world and public history at the University of Houston (UH). In 2025, Dr. Neumann along with the University of Houston Libraries Digital Humanities Core piloted the use of ClioVis through its integration into four classes and several internships at the undergraduate and graduate levels. This program served variously as a review assignment, a visualization exercise, a research tool, a content testing ground, and a communication platform. Even with minimal training, no student struggled with the technology. More importantly, ClioVis slowed students' cognitive process and facilitated their critical engagement with course material. Four case studies gathered from undergraduate history courses and internships at UH demonstrate the adaptability of the platform across temporal scales and subject matter, reinforcing its value as a tool for fostering critical historical thinking in diverse classroom contexts.

Case study: remembering and understanding¹¹

The first UH case study originates from a general survey course covering the ancient civilizations of the Middle East and Mediterranean. Key learning objectives are to 1) define and discuss the different civilizations located in this region and 2) analyze ancient texts and artifacts according to their content and context. As part of the university's core curriculum, this class serves a wide undergraduate population from across campus. Many of these students are encountering ancient history for the very first time, have no real conception of the passage of time when marked in millennia, and are accustomed to studying the past passively through rote memorization of facts as discrete units.¹² This mindset has traditionally produced exams where students remembered facts for multiple-choice and identification but struggled in demonstrating their understanding of this information within an essay question. Despite in-class activities and one-on-one encouragement of different strategies, students too easily defaulted to memorizing their notes page-by-page in the order taught rather than making their own meaning of that information within its historical context.

ClioVis provided an excellent intervention here. To empower both their remembering AND understanding of ancient civilizations, students collectively built a timeline as a review sheet for each of their three exams. For the first exam, students worked in class with partners to add terms, people, events, and artifacts from the first unit to a single class timeline (Figure 3). They first detailed each of the many civilizations of the ancient Middle East according to their major historical periods. Students next synthesized their lecture notes and textbook into a description, making sure to note geographical location, authority in charge, and relevant details from class discussion. Students lastly added an artifact or text related to those civilizations. They practiced constructing both a detailed description answering who, what, where, when, and why as well as explaining the significance of the artifact to

its civilization. Finally, students were encouraged to categorize and draw connections between events and artifacts.

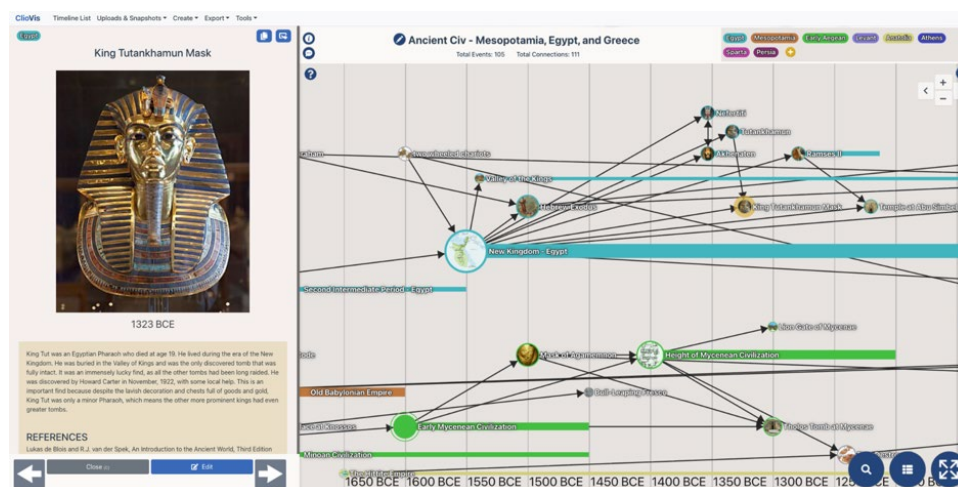


Figure 3. Screenshot of a timeline collectively built by students as an exam review.

In this activity, ClioVis empowered students to take ownership of their own learning as they collaboratively pooled their knowledge and synchronously created a shared exam resource. Instead of simply memorizing lecture notes, they honed their own skills of describing and interpreting evidence within its historical context.¹³

Case study: apply and analyze¹⁴

The second UH case study comes from an upper-level history course in which learning objectives guide students not only to outline the events of ancient Rome, but also critically evaluate the historical sources and analyze the methodologies employed in related scholarship. As a semester project, each student selected a modern published biography – academic or popular – about an ancient person who lived within the Roman Empire. This assignment required undergraduates both to study the historical figure and assess how the modern writer constructed their argument from evidence.¹⁵

ClioVis acted as a key step in this project by ensuring students had a foundational conceptualization of the ancient figure's biography and historical context before engaging with a modern writer's characterization. Students selected important events, people, evidence, and background information and then organized them within ClioVis using the “create event” and “create era” features. Students added images and media, tags to help organize nodes, and connective lines among nodes to illustrate relationships.

The result was a class-wide gallery of ancient people from the Roman Empire, where students became subject-matter experts and intentional curators of information. They did not randomly select biographical and contextual facts but distinguished what was important and the interrelationships among people, events, and overall time period.¹⁶ ClioVis propelled students out of passive reading mode to active engagement with their ancient person.¹⁷ One student commented that this exercise helped bring the past alive, saying, “It can be easy to forget that these people were real, and lived in tumultuous times.”

Furthermore, students critically examined the evidence for these ancient lives. For example, ClioVis helped a student recognize the close relationship between the major poems by Vergil and traumatic events during the transition from the Roman Republic to the Principate (Figure 4).¹⁸ Another student used the tagging system to differentiate between the supposed events retold in the myth of Rome's

founders, Romulus and Remus, and the first historical evidence for it, which dates from a much later period (Figure 5).¹⁹ By visualizing the chronology of both content and evidence, ClioVis helped students confront the challenges and often tenuous nature of archaeological and textual sources for the ancient world.

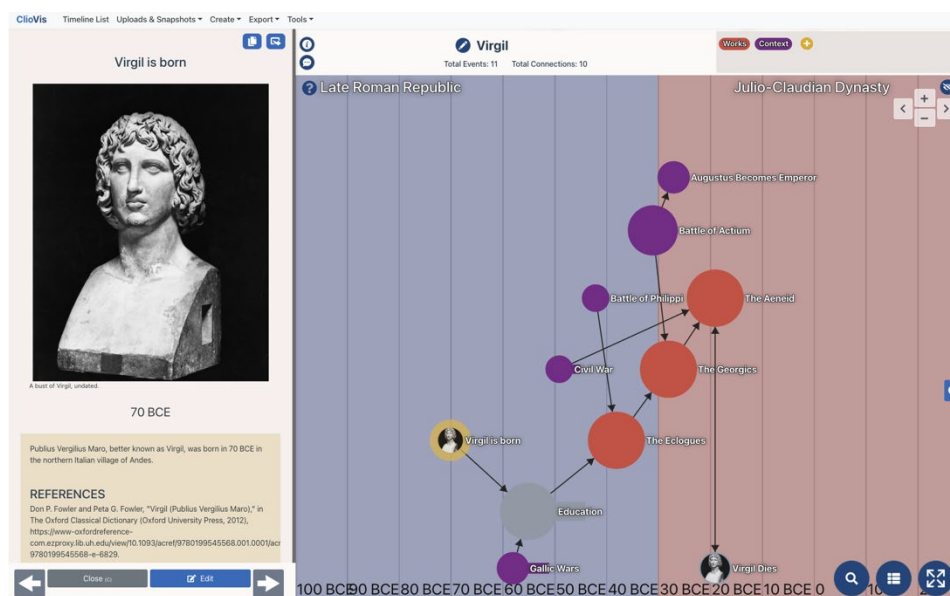


Figure 4. Screenshot of a student timeline making connections between ancient literary works and major events in the transition from Roman Republic to Principate.

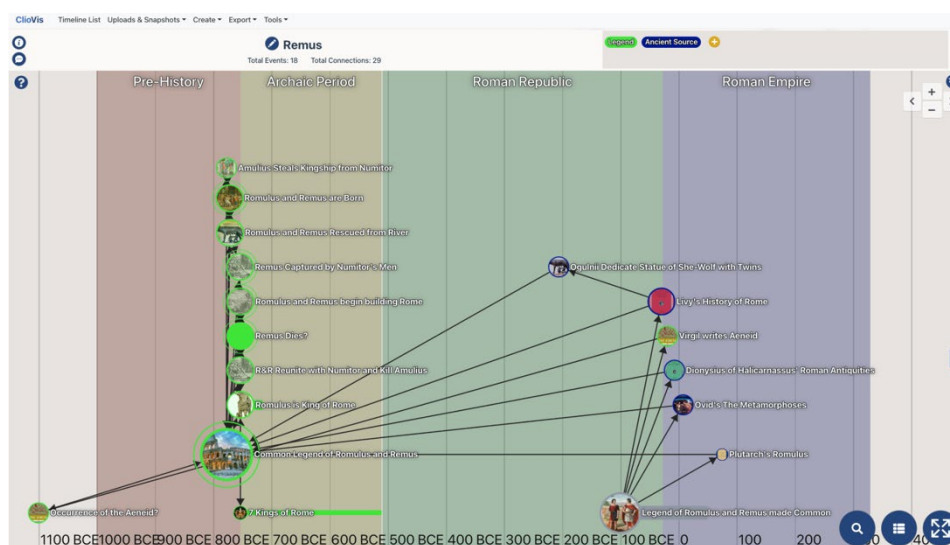


Figure 5. Screenshot of a student timeline on the myth and evidence for the founding of Rome.

Case study: evaluate and create²⁰

ClioVis also supported original student research. The third UH case study is based upon an introductory research seminar called “The Historian’s Craft.” Designed as a gateway for the history major, this course focuses heavily on the process of doing archival research, analyzing primary source documents, and building an original argument.²¹ In Fall 2025, students engaged in project-based learning by researching the history of buildings on the UH campus and producing a video presentation

for public audiences. As an intermediate step, students created a research timeline with ClioVis to organize their findings (Figure 6). This included archival and contemporary photos, biographical details about the building's namesake, additional historical documents, and important events related to the building and wider campus, city, and national context. They also added a research prospectus to the timeline description, sorted their nodes into categories, and created links between important events, people, and ideas.

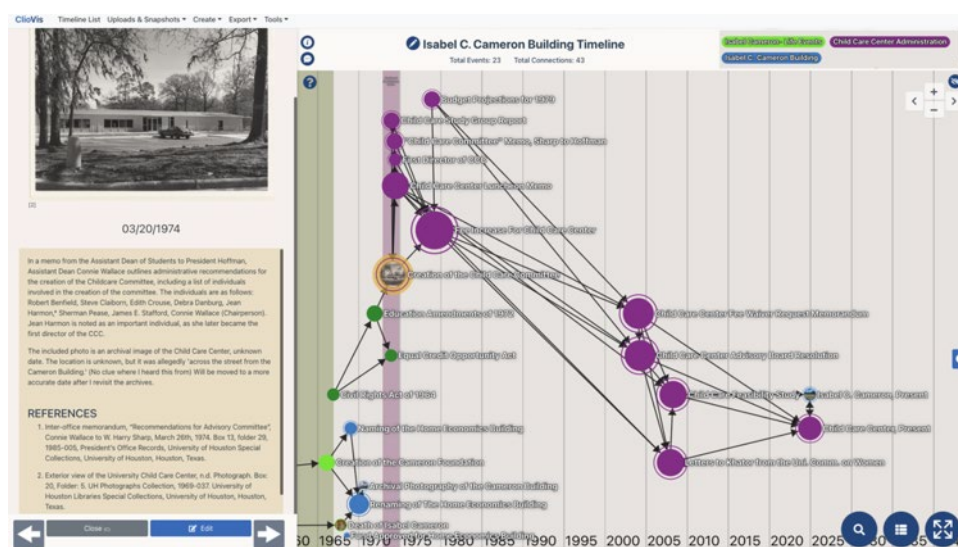


Figure 6. Screenshot of a student's research timeline into the history of a UH building.

Partway through the research process, students worked through an exercise in class with ClioVis in which they evaluated their notes chronologically, thematically, and as a series of connections.²² They examined their chronological coverage, their selection and representation of contextual events, and who were the major players or historical agents. They considered any absences, silences, patterns, or themes surfacing in the visualization as well as areas in need of additional research. The questions and discussions that emerged from this activity directly supported students in their critical thinking and production of original research and evidence-based arguments.²³ One student even commented that he “finally found the story.”

The final UH case study relates to student involvement in the co-directed digital humanities project, SYRIOS (<https://syrios.uh.edu>). This web-based exhibit explores ancient Syrian history and material culture through the lens of the coins minted there. The major goal is to recontextualize these artifacts into their historical, chronological, and spatial context.²⁴ One feature – a custom-built timeline – displays a genealogy of a Syrian city's coins alongside major historical events and against a backdrop of the different empires that controlled the region.²⁵ Initial user-experience (UX) testing on the design revealed the need for better examination of how different audiences navigated historical material within a digital timeline and whether the types of information featured produced the intended knowledge about the complexity of coins as primary evidence.²⁶ ClioVis offers an ideal environment for such investigation, as its intuitive design quickly allowed student interns to build a multilayered timeline of historical events, tags, and artifacts (Figure 7) and plan a UX test to analyze the effectiveness of language, the selection of material, and the highlighted connections between coin and context. Test results will enable significant improvements to the original timeline.

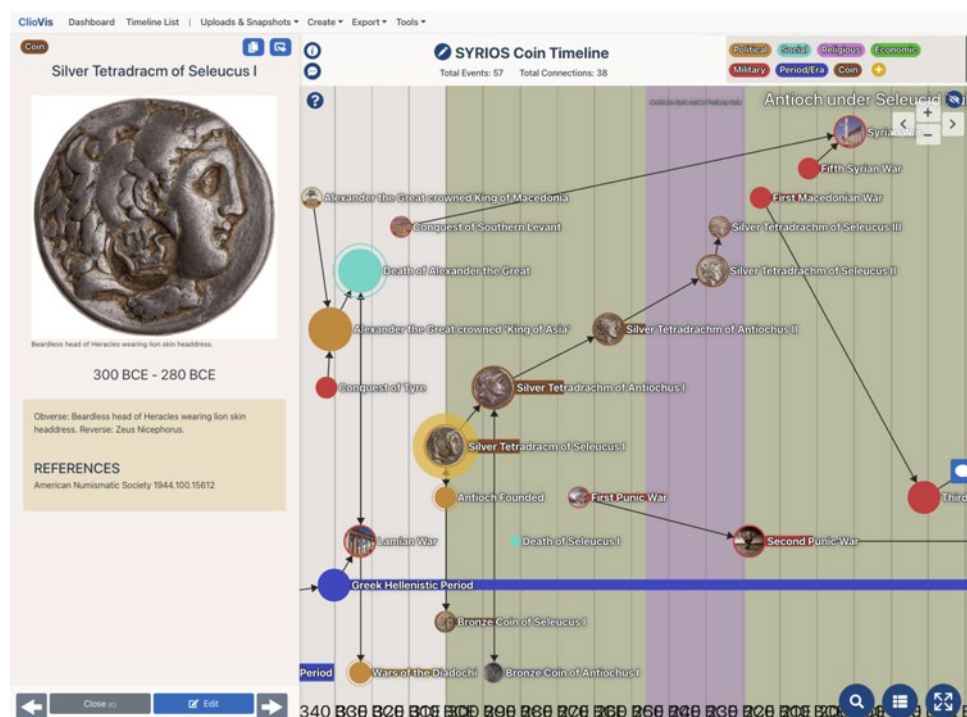


Figure 7. Screenshot of testing timeline for the digital humanities project, SYRIOS.

CONCLUSION

These case studies from the University of Texas at Austin and the University of Houston showcase the versatility of ClioVis within an educational setting. Whether as a review assignment or research platform, ClioVis supported and strengthened students' critical thinking, writing and argumentation skills, while empowering them to become active interpreters of historical knowledge through digital media. In an increasingly AI-saturated world, this technology reinforces critical skills of humanity for the 21st century.

NOTES

- ¹ One author, Erika M. Bsumek, is the creator and also co-owner and co-founder of ClioVis, Inc., a company that develops and licenses the ClioVis educational software. This potential conflict of interest has been reviewed and is managed in accordance with the policies of The University of Texas at Austin.
- ² Lindsey Wieck, "Review - Erika Bsumek, Matt O'Hair, Ian Diaz, Braeden Kennedy. ClioVis," *Teaching History: A Journal of Methods* 50.1 (2025): 53-56, <https://doi.org/10.33043/4waub5gx5fj>.
- ³ Benjamin S. Bloom et al., *Taxonomy of Educational Objectives: The Classification of Educational Goals* (New York: Longmans, Green, 1956); Lorin W. Anderson and David R. Karthwohl, *A Taxonomy for Learning, Teaching, and Assessing* (New York: Longman, 2001).
- ⁴ David Ochsner, "Bridge to Somewhere," *Life & Letters Magaziitsne* (April 30, 2015), <https://lifeandletters.la.utexas.edu/2015/04/bridge-to-somewhere/>.
- ⁵ Anderson and Krathwohl, *A Taxonomy*, 83-88.
- ⁶ Richard Haw, *The Brooklyn Bridge: A Cultural History* (New Brunswick, N.J.: Rutgers University Press, 2005).
- ⁷ Richard Haw, *Engineering America: The Life and Times of John A. Roebling* (New York: Oxford University Press, 2020).
- ⁸ María-Pilar Molina-Torres, "Ancient History Education through Project-Based Learning," *Journal of Classics Teaching* 26.51 (2025): 88–93, <https://doi.org/10.1017/S2058631024000783>.
- ⁹ Brigid J. S. Barron et al., "Doing With Understanding: Lessons From Research on Problem- and Project-Based Learning," *Journal of the Learning Sciences* 7.3–4 (1998): 271–311; Stephanie Bell, "Project-Based Learning for the 21st Century: Skills for the Future," *The Clearing House* 83.2 (2010): 39–43, <http://www.jstor.org/stable/20697896>.
- ¹⁰ Mohammed Zeinu Hassen, "The Impact of AI on Students' Reading, Critical Thinking, and Problem-Solving Skills," *American Journal of Education and Information Technology* 9.2 (2025): 82-90; Lubica Stuchlikova and Martin Weis, "From Information to Insight: Reimagining Critical Thinking Pedagogy in the Age of Artificial Intelligence," *2024 International Conference on Emerging eLearning Technologies and Applications (ICETA)*, (Sary Smokovec, Slovakia, 2024), 591-598. doi:10.1109/ICETA63795.2024.10850787.
- ¹¹ Anderson and Karthwohl, *A Taxonomy*, 66-76.
- ¹² Carla van Boxtel and Jannet van Drie, "'That's in the Time of the Romans!' Knowledge and Strategies Students Use to Contextualize Historical Images and Documents," *Cognition and Instruction* 30.2 (2012): 114-115.
- ¹³ See H.G.F. Havekes et al., "Knowing and Doing History. A Conceptual Framework and Pedagogy for Teaching Historical Contextualisation," *International Journal of Historical Learning, Teaching and Research* 11.1 (2012), 73-83.
- ¹⁴ Anderson and Krathwohl, *A Taxonomy*, 77-83.
- ¹⁵ See Robert Berkhofer Jr., "Demystifying Historical Authority: Critical Textual Analysis in the Classroom," *AHR Perspectives* (February 1988): 13-16.
- ¹⁶ Anderson and Krathwohl, *A Taxonomy*, 80-83; Havekes et al., "Knowing and Doing History," 85-88.
- ¹⁷ Valerie S. Thaler, "Teaching Historical Research Skills to Generation Y: One Instructor's Approach," *The History Teacher* 46.2 (February 2013): 267-272.
- ¹⁸ Richard Tarrant, "Poetry and Power: Virgil's Poetry in Contemporary Context," in *The Cambridge Companion to Virgil*, ed. Fiachra Mac Góráin and Charles Martindale (Cambridge: Cambridge University Press, 2019), 243-262.
- ¹⁹ T.P. Wiseman, *Remus: A Roman Myth* (Cambridge: Cambridge University Press, 1995).
- ²⁰ Anderson and Krathwohl, *A Taxonomy*, 83-88.
- ²¹ Dominic G. Morais, "Doing History in the Undergraduate Classroom," *The History Teacher* 52.1 (November 2018): 52-53.
- ²² Anderson and Krathwohl, *A Taxonomy*, 83-84.
- ²³ Joanne Kurfiss, *Critical Thinking: Theory, Research, Practice, and Possibilities*, ASHE-ERIC Higher Education Report No. 2. (Washington, D.C.: Association for the Study of Higher Education, 1988), 2-3, 87-89; Anderson and Krathwohl, *A Taxonomy*, 84-88.
- ²⁴ Kristina Neumann, Peggy Lindner, and Elizabeth Rodwell, "Digital Numismatics and Data Visualization for Ancient Antioch," in *Proceedings of the XVI International Numismatic Congress, 11–16.09.2022, Warsaw*, Vol. iv: *Medals, Modern, and General Numismatics*, ed. Jarosław Bodzek, Aleksander Bursche, and Anna Zapolska (Turnhout: Brepols, 2025), 325–335.
- ²⁵ "Coins in Time," SYRIOS, accessed January 1, 2026, <https://syrios.uh.edu/Evidence/Timeline>.

²⁶ Elizabeth Rodwell, Kristina Neumann, and Peggy Lindner, "User Experience (UX) Heuristics for the Digital Humanities," *Digital Humanities Quarterly* 19.4 (2025).
<https://dhq.digitalhumanities.org/vol/19/4/000822/000822.html>

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TEAR IT UP AND START AGAIN: ISSUES OF (NON) REPRESENTATION

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INTRODUCTION

This paper examines a pedagogical intervention in a second-year BA Graphic Design module at Leeds Beckett University. The cohort is primarily local and UK-based, diverse in class, ethnicity, sex, and gender identity, with strong creative skills that often outweigh traditional academic experience. Yet students struggled to see their own practices, references, and lived experiences reflected in graphic design curricula, in which white, Western, male “superstar” designers continue to dominate. The global Black Lives Matter protests of 2020 brought issues of racism, state violence, and social injustice into urgent public debate, and inevitably into the design studio. Within this context, it became impossible to continue teaching a Level Five BA Graphic Design module at Leeds Beckett University, titled “Key Debates in Graphic Design and Cultural Contexts,” without confronting systemic underrepresentation and the persistence of an unquestioned canon head-on. What emerged from an ongoing, collaborative process that involved both students and staff was a model that reworks curricular content and foregrounds research skills and critical awareness.

QUESTIONING THE CANON: CRITICAL ISSUES IN GRAPHIC DESIGN EDUCATION

The main issue confronting graphic design education, made particularly visible in 2020 and remaining ongoing, is twofold: the persistence of a narrow canon and the systemic underrepresentation it (re)produces. Design education continues to orbit an inherited canon shaped by Eurocentric historical modernism and a disproportionate reliance on Anglo-American contemporary references. This canon largely features work by white male practitioners, while the figure of the “superstar” graphic designer has persisted since the 1990s. This pervasive bias is embedded not only in celebrated practices but also in curriculum design courses across UK higher education, posing a significant challenge to fostering inclusive learning environments — what Suzy Tutchell and Stephanie Sharp have termed the “patriarchal knowledge base.”¹ In addition, within this framework, design pedagogy often privileges Western, capitalist narratives of authorship, innovation and value. When diverse, non-Western creative practices are explored, they are often sidelined, positioned as supplementary rather than integral to disciplinary histories. As a result, historically overlooked design practices outside the Euro-American canon continue to be marginalised.²

If design education is to avoid reproducing inequalities in “ways of seeing,” critical ideas need to be made concrete, accessible, and actively mobilised by those in design pedagogy.³ Recent examples demonstrate that such change is both possible and ongoing. As Cheryl D. Holmes-Miller’s reaction to

the seventh edition (2025) of Meggs' *History of Graphic Design* attests: "With excitement, I looked over the index to discover 25 Black designers in the 7th edition. That's a 750% increase in visibility of Black Graphic Designers from merely three references in the previous six editions."⁴ Holmes-Miller is one of several educators whose sustained teaching and research have actively contributed to this shift,⁵ demonstrating both the depth of the challenge and the possibilities for rethinking how graphic design knowledge is constructed and taught.⁶

What remains less examined, however, is how exclusions are reproduced, ultimately stabilising the canon as common sense. Moving beyond redistributive approaches — such as diversifying reading lists — our intervention approaches graphic design education as a situated knowledge system shaped by histories of citation, legitimacy, and exclusion.⁷ What follows outlines an approach situated in Leeds offered as a point of departure rather than a fixed or universally replicable model.

Citational justice as a pedagogical framework

Citational justice offers a framework for design education that dismantles the dominant narrative of the isolated creative genius in favour of recognising design as relational and collaborative. As Sara Ahmed argues, citation functions as "a reproductive technology, a way of reproducing the world around certain bodies [...] citational structures form what we call disciplines, determining whose work becomes foundational, whose methods become legitimate, and whose voices become authoritative."⁸ These insights inform how we structured the module.

Citational justice rests on three linked concepts: relationality (Escobar),⁹ which understands design knowledge as developing through interaction with other practices and cultural contexts; care (Puig de la Bellacasa), which frames citing as a practice of maintaining and nurturing intellectual connections;¹⁰ and debt (Ahmed), which recognises what is owed to those who came before, especially where lineages have been obscured. Together, these principles make visible how knowledge systems privilege certain forms of authorship while rendering others less legible.

Within this module, citational justice provides a theoretical hinge between canon critique and pedagogical method: students are invited not only to locate "missing" practitioners, but also to examine how recognition is produced through citations, sources, and institutional conventions, and what those conventions exclude.

The brief as method: researching significance and underrepresentation

We redesigned the module to foreground what had been absent from discussions of graphic design and critical cultural contexts. Rather than treating design history as a body of content to be mastered, it became a contested field in which students were encouraged to intervene.¹¹ The module brief asks students to identify and research a creative practitioner (an individual, collective, or studio) whose work is significant yet underrepresented. There are two parts to the brief: first, students produce a fact-checked, fully referenced "Wikipedia-style" entry that establishes a clear and verifiable account of the practitioner or project. Second, they develop a critical argument explaining why the practitioner and their work are significant yet underrepresented, drawing on material from lectures, seminars, and the reading list, and extending these curriculum sources through their own research.

Framed through citational justice, the brief positions research not as the discovery of new "creative genius" figures but as an ethical practice of recognising, situating, and arguing for significance within existing knowledge systems.¹²

While the module's lectures introduce topics such as class and creativity, ideology, technology, and representation, seminars functioned as the primary pedagogical space of the module. Seminar sessions were structured around discussions, student presentations, and in-session writing and visual analysis exercises, where students and staff actively work through ideas together. For each weekly seminar,

students engaged with two selected “texts”, which could be readings, images, or short videos and responded to specific questions.¹³

Central to the brief is giving students permission to research topics that matter to them, guided by the module’s curated resources and structured discussions. Students are not asked simply to add overlooked names to an existing narrative, but to argue for significance by making explicit the criteria, sources, and assumptions by which recognition is granted or denied. In this context, the canon is encountered not as a static body of knowledge, but as an infrastructure students can analyse, question, and revise.

STUDENT RESEARCH ENCOUNTERS

The following examples illustrate how students engaged with the brief as a research method, encountering questions of visibility, authorship, and underrepresentation while drawing their own lines of inquiry. Rather than producing uniform outcomes, the assignment generated distinct research trajectories shaped by students’ interests, experiences, and the constraints imposed by time and available sources.

Elishiah researched Canadian visual artist Nimisha Bhanot, whose practice explores media portrayals of South Asian women. The student approached the project as an opportunity to identify with creatives whose work reflected her own background, while examining how visual cultures mediate gendered and racialised representation. The research informed both her critical skills and her own creative practice, demonstrating how “giving permission” — to research overlooked narratives and to cite differently — enables students to see themselves within design’s knowledge systems.

Hannah’s research on disability and inclusion centred on Kat Holmes’ book *Mismatch: How Inclusion Shapes Design*.¹⁴ Drawing on her lived experience as a student with disabilities and a passionate advocate for disability rights, Hannah combined personal experience, academic and journalistic sources, and design case studies to articulate the urgency of inclusive design. Equally important was her identification of the scarcity of resources on disability, both institutionally and within design education, to which her research contributed.

Sam’s interest in ecology provided a starting point for examining how contemporary designers respond to climate change and sustainability, including how these concerns challenge profit-driven logics that are often naturalised within the canon. His particular focus on print design called into question the production of a guidebook designed by *Tooot* (The Office of Ordinary Things) for the brand *Patagonia*, asking how ethical and environmental considerations were negotiated from concept to print, and to what degree this negotiation proved successful.



Figure 1. The Office of Ordinary Things, Boulder Guide Book

Jess researched Abdo Mohamed, a self-taught graphic designer from Cairo specialising in experimental typography. Drawing on module material, Jess considered how decolonised approaches to type shifted her understanding of type beyond Latin scripts, while highlighting the uneven representation of typographic histories in graphic design publications.

Hawaiian student Lily researched *Ē Luku Wale Ē* (translated as Devastation upon Devastation), a photography project and photobook by Kapulani Landgraf and Mark Hamasaki, working collectively as Piliāmo‘o, documenting environmental destruction caused by the construction of the H-3 Interstate in Hawai‘i. Although a Wikipedia page already existed for Landgraf, the civil rights movement responding to this destruction was absent. Lily extended the entry by adding omitted contexts, demonstrating how students can intervene in existing knowledge infrastructures rather than simply add new entries. Her expanded entry was successfully published on Wikipedia.¹⁵

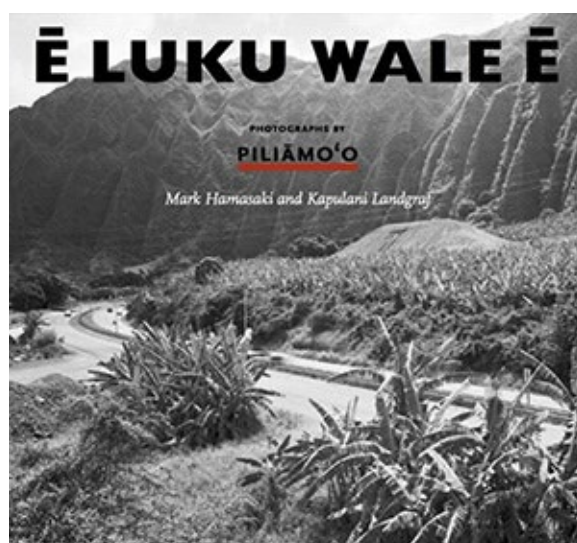


Figure 2. Piliāmo‘o (Mark Hamasaki, Kapulani Landgraf), *Ē Luku Wale Ē*

These moments, while not prescribed by the curriculum, situate students’ research within broader visual and cultural landscapes. As one student reflected: “This made me realise this module is way deeper than just graphic design. Everything links back to how people are represented and who gets to be seen in visual culture.”

WHY “WIKIPEDIA-STYLE”? WIKIPEDIA AS CONTESTED KNOWLEDGE INFRASTRUCTURE

At first glance, Wikipedia seems an unlikely choice for design pedagogy. Lifting the lid on Wikipedia here, however, is not treated as a tool for inclusion but as a device that makes visible how knowledge legitimacy is produced, restricted, and policed.¹⁶ As one of the most-visited websites in the world and the only non-commercial, not-for-profit platform among them, Wikipedia functions as a communal knowledge infrastructure whose notability criteria, editorial practices, and citation requirements expose how disciplinary canons are constructed and maintained. This approach aligns with broader pedagogical uses of Wikipedia in higher education, foregrounding collaborative knowledge-making between students and staff and recognising both the limits of tutors’ expertise and students’ capacity to contribute to evolving fields of knowledge.¹⁷

Working with Wikipedia positions students as active participants in knowledge production rather than passive recipients of disciplinary curricula and canons. As McDowell and Vetter demonstrate,

engaging with Wikipedia in pedagogical contexts exposes power imbalances, contested histories, and the politics of visibility that shape public knowledge.¹⁸

Wikipedia's demand that sources be frequently referenced,¹⁹ its collective monitoring and editorship, and its potential for self-correction in addressing its own limitations and biases (though never without controversy)²⁰ align with critical pedagogical approaches. At the same time, these mechanisms reveal the limits of what can be said, cited, or sustained within its framework. It is precisely this tension, between openness and constraint, that makes Wikipedia a productive model for design education.

Students may have been previously advised not to use Wikipedia because it is considered unreliable, even though major institutions such as the Tate rely on it for artists' biographies.²¹ This contradiction becomes a teaching moment: sites of knowledge are neither fixed nor neutral; their authority is historically and institutionally contingent, and as such, open to contestation and change.

LIMITATIONS AND FUTURE DIRECTIONS

The module has evolved significantly over five years of implementation, with productive tensions emerging around notability, significance, and linguistic access. The brief initially focused on producing Wikipedia-style entries before moving into the Wikipedia sandbox. More recently, this led to the development of a dedicated project website that preserves the ethos of open knowledge production — rigour, referencing, and critical framing — while removing barriers such as notability criteria and licensing constraints that can restrict what students can meaningfully document. Approaching design education through citational justice also reveals its limits, particularly when significance cannot be readily substantiated by existing sources. Students frequently discover that underrepresented practices are absent from traditional academic literature and difficult to access. Disability in design, for example, remains sparsely documented, prompting students to work with alternative sources such as social media, direct contact with practitioners, and community archives. Since the module does not aim to produce Wikipedia-compliant entries but rather to interrogate what Wikipedia's standards exclude, students must articulate why their chosen work matters and how it connects to the module's broader themes. These frictions become central to the learning process.

A further limitation arises when designers are well known within their countries or regions of origin but remain absent from predominantly UK- and US-based reading materials. This points to the broader underrepresentation of design practices outside Europe and North America, compounded by linguistic bias, as sources must often be accessible in English to be usable within the assignment. While some students draw on additional language skills to overcome this barrier, it remains an uneven and structural constraint that continues to shape what can be researched and cited. Although this paper focuses on Level Five (Year Two), the pedagogical approach extends into subsequent modules, where students deepen their research skills and carry these critical concerns forward into extended studio projects and dissertation work.

CONCLUSION

This pedagogical intervention demonstrates that design education can move beyond the politics of inclusion — adding diverse names to an existing canon — toward recognition-based practices that interrogate how canons are constructed and maintained. Design education has devoted considerable attention to what should be included in the canon, but far less to how students encounter and learn to question the limits of knowledge systems themselves.

By positioning Wikipedia as contested infrastructure rather than a neutral repository, students develop critical literacy about knowledge production itself. They learn that authority is historically contingent, that sources can be questioned, and that they have agency in shaping what counts as significant. The research brief transforms students from consumers of design history into co-creators of disciplinary

knowledge. Students are not simply completing an assignment; they are contributing to knowledge production in design history and contemporary practice, creating references that reflect their interests while bringing these inquiries into their studio work. Through this practice, students recognise themselves as legitimate knowledge-makers — positioned within networks of ideas, people, and histories, with responsibility for the perspectives they choose to amplify or silence.

The transferability of this approach depends not on replicating the exact assignment structure but on embracing its underlying principles: treating citation as political practice, validating students' research into non-scholarly sources as legitimate inquiry, and positioning knowledge systems — and subsequently power — as contestable rather than given. As Donna Haraway reminds us: “It matters what stories we tell to tell other stories with.”²² In design education, it matters who gets to tell those stories, whose work becomes citable, and which students see themselves as legitimate knowledge-makers.

NOTES

¹ Suzy Tutchell and Stephanie Sharp, "Gendered Identity: Reminders of Equality through Art and Fiction," *Frontiers in Education* 7 (2022): 983760, <https://doi.org/10.3389/feduc.2022.983760>

² This pattern of systemic underrepresentation in Graphic Design Education repeats across UK courses, where critical contextual studies often draw on a limited number of historical and theoretical references, while many widely used graphic design history textbooks continue to neglect issues of race, colonialism, and cultural appropriation. As Nan O'Sullivan writes in relation to experiences in New Zealand: "This has resulted in current design pedagogy being dominated by a working model that privileges Western and capitalist influences. Although acknowledged as valuable to design, when diversity is explored as non-Western creative practice, quixotically it is still found to be sidelined within design curricula, which remain dominated by the Eurocentric, hegemonic, and linear (not circular) ideals." O'Sullivan, Nan. "DO THE MAHI, REAP THE REWARDS: Working Towards the Integration of Indigenous Knowledge Within Design Education." In *Design Struggles: Intersecting Histories, Pedagogies, and Perspectives*, edited by Claudia Mareis and Nina Paim. (Amsterdam: Valiz, 2021), 250.

³ John Berger, *Ways of Seeing* (London: Penguin, 2008).

⁴ Cheryl D. Holmes-Miller, "New Edition of 'Meggs' History of Graphic Design' Reforms the Canon." November 4, 2025. Accessed January 19, 2026, <https://www.printmag.com/design-education/meggs-history-of-graphic-design-7th-edition-reforms-the-canon/>.

⁵ Cheryl D. Holmes-Miller, "Black Designers: Missing in Action," Print (blog), originally published 1987, republished 2016, <https://www.printmag.com/design-culture/black-designers-missing-in-action-1987/>

⁶ See Cheryl D. Holmes-Miller, *HERE: Where the Black Designers Are*. San Francisco CA: Chronicle, 2024.

⁷ Donna Haraway, "The Science Question in Feminism and the Privilege of Partial Perspective," *Feminist Studies* 14, no. 3 (1988): 575.

⁸ Sara Ahmed, "Making Feminist Points," *Feminist Killjoys* (blog), September 11, 2013, accessed January 6, 2026, <https://feministkilljoys.com/2013/09/11/making-feminist-points/>.

⁹ Arturo Escobar, *Designs for the Pluriverse: Radical Interdependence, Autonomy, and the Making of Worlds* (Durham, NC: Duke University Press, 2018).

¹⁰ María Puig de la Bellacasa, *Matters of Care: Speculative Ethics in More Than Human Worlds* (Minneapolis: University of Minnesota Press, 2017).

¹¹ Haraway, 'Situated Knowledges,' 575.

¹² Sarah A. Sauvé, Sara L. Middleton, Helena M. Gellersen, and Flavio Azevedo, *In Pursuit of Citational Justice: A Toolkit for Equitable Scholarship*, July 31, 2025, OSF Preprints, <https://doi.org/10.31222/osf.io/qjegy>

¹³ Materials included the toppling of Edward Colston's statue in Bristol and its replacement by a protester giving the Black Power salute; discussions of racist abuse directed at an English footballer and community responses to the defacing of a public mural; articles on gender stereotyping in typography linked to Judith Butler's work on gender; articles on decolonizing graphic design; and examples of cultural appropriation.

¹⁴ Kat Holmes, *Mismatch: How Inclusion Shapes Design* (Cambridge, MA: MIT Press, 2018)

¹⁵ The additional sections appear under the subtitle *Ē Luku Wale Ē* on Kapulani Landgraf's Wikipedia entry (Wikipedia Foundation, accessed January 20, 2026).

¹⁶ Zachary J. McDowell and Matthew A. Vetter, "Wikipedia as Open Educational Practice: Experiential Learning, Critical Information Literacy, and Social Justice," *Social Media + Society* 8, no. 1 (2022), <https://doi.org/10.1177/20563051221078224>.

¹⁷ Collaborative approaches to addressing gaps in graphic design histories are also evident in a growing body of practitioner-, student-, and educator-led resources. Circulated largely through social media and informal networks, such resources enable students, staff, and librarians to track emerging practices and debates without relying solely on established academic sources. For example, see the sites *Where Are the Black Designers?*, *Alphabettes*, *Femmetype*, and *Extra Bold: A Feminist, Inclusive, Anti-Racist, Nonbinary Field Guide for Graphic Designers* co-authored by Ellen Lupton with former students Farah Kafei and Valentina Vergara, in collaboration with Jennifer Tobias. Also see Susan Giblin and Brian McKenzie. "Waking Students Up to Systemic Bias: Using Wikipedia from a Critical Pedagogy Perspective". *Journal of Transformative Education*, 2025. <https://doi.org/10.1177/15413446251383885>.

¹⁸ McDowell and Vetter, "Wikipedia as Open Educational Practice." See also Zachary J. McDowell and Matthew A. Vetter, *Wikipedia and the Representation of Reality*, (London: Routledge, 2021), <https://doi.org/10.4324/9781003094081>

¹⁹ "Wikipedia's verifiability policy requires inline citations for any material challenged or likely to be challenged, and for all quotations, anywhere in article space." Wikipedia: Citing Sources, Wikipedia Foundation. Accessed January 19, 2026. https://en.wikipedia.org/wiki/Wikipedia:Citing_sources

²⁰ In 2002, approximately 90% of Wikipedia articles were written in English. This pronounced anglophone bias was widely recognised and subsequently addressed; by 2023, around 90% of Wikipedia articles were published in languages other than English. Efforts to diversify Wikipedia's contributor base have included initiatives such as Wiki Education and localised edit-a-thons, most notably those organised around International Women's Day, designed to address persistent imbalances in the number of biographies of women compared to men.

²¹ All artist biography entries on the Tate website are drawn directly from, and redirect users to, the corresponding Wikipedia pages.

²² Donna J. Haraway, *Staying with the Trouble: Making Kin in the Chthulucene*, Durham NC and London: Duke University Press, 2016, 12.

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VALUE-BASED CHARTS AS DESIGN TOOLS

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INTRODUCTION

This paper explores the pedagogical features of implementing charts as design and visual display tools for negotiating value systems in architectural education, highlighting their role in encouraging collective reflection and critical thinking. More specifically, the paper investigates the non-spatial dimensions of architectural representation, or rather: how charts can operate as cognitive and communicative instruments that help collectives think through the “why” of design, not just the “what.” This approach is guided by a pedagogical question, namely: Can we teach design not only as the production of form, but as a form of reflective negotiation?

Historically, there have been efforts to structure environmental design education at a programmatic level—for example, Robert Geddes and Bernard Spring’s *Modular Jointed Framework for Environmental Education* in *A Study of Education for Environmental Design*¹—which organized curricula into segments and pathways to navigate complex environmental knowledge. While such frameworks operated at the curricular scale rather than through studio-level design tools, they demonstrate a longstanding interest in making environmental knowledge teachable and navigable.

In particular, the paper focuses on the comparison between two value-based charts and how they respectively impacted design thinking and making in an undergraduate design studio. The first chart is Malcolm Wells’ *Wilderness-Based Chart* (1969), a tool designed to quantify environmental values through a scoring system, which draws primarily on qualitative data. The second is an updated version developed by the Society of Building Science Educators (SBSE), titled the *Regeneration-Based Checklist* (1999), which aligns more closely with quantitative frameworks such as LEED (Leadership in Energy and Environmental Design) and The Living Building Challenge (LBC). Wells’ and SBSE’s charts are assumed as remarkable precedents as they highlight values such as “regeneration” and “responsibility” that are widely invoked in architectural education yet often remain abstract and/or implicit. Students may learn to reference environmental goals, but they are seldom equipped with tools that allow them to work through conflicting values in a reflective and critical way.

To ground this pedagogical question, this paper draws on the work of psychologists Alexander Renkl and Katharina Scheiter, who propose acknowledging three core characteristics of Visual Displays (ViDis) methods in education.² The first emphasizes teaching students how to learn with Visual Displays, viewing them as a kind of cognitive prosthesis that supports individual and collaborative learning. The second relates to ViDis as a tool to translate numerical and conceptual information from verbal form into visual representations that enhance comprehension. The third characteristic concerns ViDis as tools for reducing complexity, transforming dense information into simplified, symbol-based forms that are easily recognizable. Given the context of architectural design education, all three

previously mentioned characteristics are fundamental. However, the paper will focus primarily on the second ViDis function, namely the translation of value systems from verbal to visual representations. Therefore, the research question could better be re-formulated in the following way: How can visual charts translate ecological, social, and cultural values into tools for critical reflection and negotiation in architectural design education?

VALUE-BASED CHECKLISTS

The following section introduces Malcolm Wells' "wilderness-based" chart as a historical and conceptual starting point, which transformed ecological ethics into a visual framework for design. Wells, an American architect, writer, columnist, cartoonist and lecturer, emerged in the 1960s as a key voice in the early ecological design movement. Rejecting modernist abstraction, he advocated for what he called "gentle architecture"³: buildings that integrate with natural systems, often earth-covered or entirely underground. In 1969, he developed the *Wilderness-Based Checklist for Design and Construction* or, shortened: *Wilderness-Based Chart*, (fig.1) subtitled *Absolutely Constant Incontestably Stable Architectural Value System*,⁴ evaluating impact on air, water, food, soil, solar energy, silence, waste, maintenance, nature's cycles, human and wildlife habitat, weather and beauty. Although not strictly a set of design instructions, Wells embedded within the chart a modus operandi that translates values into simple design problems. It presents fifteen pairs of opposing attributes—such as creates pure air / destroys pure air, is beautiful / is ugly—each evaluated using a scoring system ranging from −100 to +100. Harmful actions reduce the overall score, whereas regenerative actions increase it. For Wells, the term "wilderness-based" referred to a pristine natural setting—which would receive the maximum score across all attributes, resulting in a total of +1500.

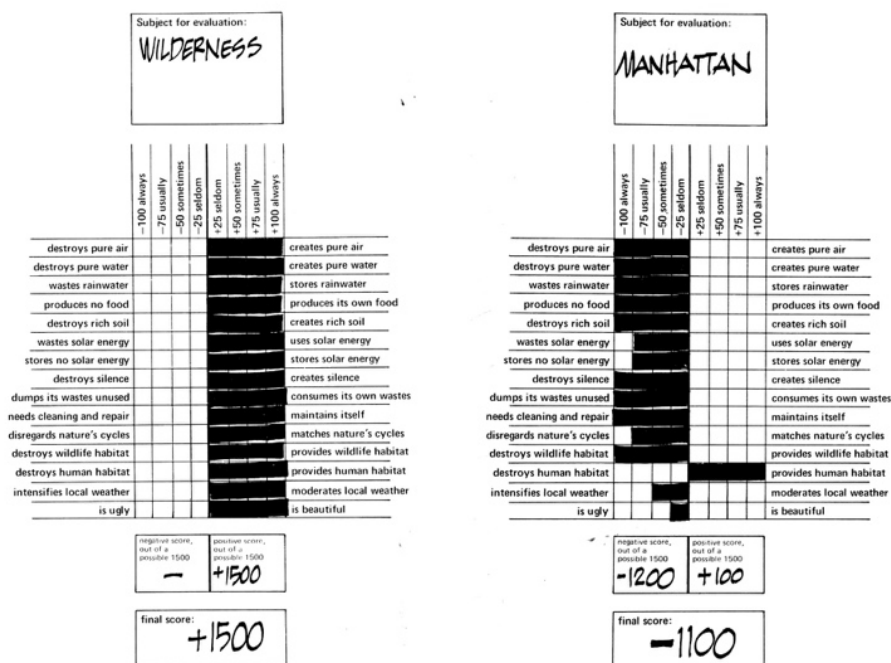


Figure 1. Malcolm Wells, *Wilderness-Based Checklist for Design and Construction* (1969) applied to the case study of *Wilderness* and *Manhattan*

The collective validity of the *Wilderness-Based Chart* was recognized and confirmed in 1999, when, thirty years after its original publication, the Society of Building Science Educators (SBSE) released

an updated version titled the *Regeneration-Based Checklist for Design and Construction*. (fig.2) The most notable change in this update was the replacement of the term “wilderness” with “regeneration.”⁵ The structure of the chart, and especially the listed attributes, now reflected a new opposition: no longer natural vs. artificial, but rather degeneration vs. regeneration. Furthermore, the attributes were divided in two categories “the site” and “the building.” The attribute “transportation” was added to the site category, while natural light, passive systems, recyclability, human comfort, circulation, neighborhood integration and symbolism were added to the building category. The number of entries increased from fifteen to twenty-two, raising the maximum possible score to 2200. This shift reflected new knowledge and environmental awareness, focusing on regenerative systems, energy, materials, and social vitality. It revealed a crucial insight: charts like these are not static measuring devices, they are negotiation tables, continually revised as cultural and ecological priorities evolve.

Figure 2. Society of Building Science Educators, Regeneration-Based Checklist for Design and Construction (1999)

LEGACY

The evolution from Wells’ *Wilderness-Based Chart* to the SBSE *Regeneration-Based Checklist* illustrates how ecological values can be translated into actionable frameworks, while remaining open to negotiation and reinterpretation. This pattern is part of a broader historical lineage: architects have long used visual charts to articulate collective priorities, social ideals, and environmental principles. Early examples include the *CIAM grids* developed at the CIAM 7 and 9 congresses. The CIAM 7 Grid, introduced in 1949 in Bergamo and aligned with Le Corbusier’s functionalist town planning, provided a framework for organizing projects according to basic functions such as living, working,

recreation, and circulation. Intended as a normative instrument binding participants to principles, it also served as both an analytical and representative tool.⁶

The grid was revised by Alison and Peter Smithson at the center of CIAM 9 in 1953 in Aix-en-Provence. Redefining its values was crucial for the formation of Team 10 and its subsequent separation from CIAM. Team 10's *Urban Re-Identification Grid* radically revised the CIAM framework by replacing functional categories with more general ones "house," "street," "district," "city," and "relationship."⁷ By changing the categories and including photographs of street life in a London workers' neighborhood, the grid emphasized everyday reality and public space, themes that previous CIAM meetings had largely ignored.⁸

Professional Certification Tools

From these mid-century grids, we can trace a lineage to contemporary environmental evaluation frameworks. Just as CIAM and Team 10 charts made values explicit through visual representation, professional certification tools currently used in North America such as *LEED*, *WELL*, and the *Living Building Challenge (LBC)* translate ecological and social concerns into measurable or observable design criteria. While they focus on building-scale performance and certification, the underlying principle remains the same: charts and frameworks serve as instruments to make values operational, guiding decision-making and facilitating negotiation between competing priorities.

However, while these professional certification tools are discussed in foundational and widely adopted textbooks like *Building Construction Illustrated*,⁹ they are seldom directly applied in undergraduate design studios due to their complexity and performance-based nature, although they strongly influence how sustainability is defined and operationalized in practice. Examining them here helps clarify what kinds of values are being measured today, and how differently these tools function compared to more reflective frameworks like Wells' and the SBSE checklist.

The green building certification system LEED (Leadership in Energy and Environmental Design), developed by the U.S. Green Building Council and formally launched in 2000 evaluates environmental performance across 9 categories. Certification is achieved at four levels. It offers flexibility and trade-offs across categories and prioritizes modeled rather than verified performance through points and modeled compliance.¹⁰

The WELL Building Standard is a performance-based building certification system launched in 2014 and overseen by the International WELL Building Institute. It shifts the focus toward occupant health, integrating behavioral and physiological factors into design. Its structure is organized around ten concept categories. Certification is verified by on-site performance testing, with again, four achievement levels.¹¹ Many of the concept areas parallel core Regeneration-Based checklist categories, such as air quality, water systems, movement/circulation, and sound, yet WELL adds Mind and Community emphasizing cognitive and social well-being alongside physical health.

The Living Building Challenge (LBC), formally launched in 2006 and continuously evolved by the International Living Future Institute, emphasizes strict, performance-based regenerative outcomes, requiring demonstrable operation over a full year. LBC illustrates a more prescriptive approach than LEED or WELL: rather than allowing trade-offs or partial compliance, it demands verified results across all 7 petals/categories, including ecological performance and social equity. Imperatives are binary (met or not met).¹²

Together, these systems demonstrate a spectrum of approaches, which designers encounter today, from flexible, point-based frameworks to rigorous, binary standards. All of these charts are attempts to make values explicit and actionable.

While certification systems quantify and verify performance, holistic reflective frameworks, by contrast, use prompts and negotiation tools to guide reflection and encourage discussion. The

American Institute of Architects (AIA) Framework for Design Excellence, developed in 1997 with the creation of the Committee on the Environment Top Ten, initially called the “Earth Day Top Ten”, served as an early framework for evaluating design through an ecological lens. In 2019, it was formally adopted as the Framework for Design Excellence.¹³ It expands the scope of value-based evaluation by integrating social, economic, and epistemic priorities alongside ecological considerations.¹⁴ Unlike previously mentioned charts it uses reflective prompts rather than scored metrics, encouraging critical thinking and holistic reflection without prescribing quantifiable performance.

When we examine LEED, WELL, LBC, and the AIA Framework alongside Wells’ and the SBSE checklist, several patterns emerge. Contemporary tools incorporate more categories, integrate human health and social equity, and allow trade-offs, flexible scoring or no scoring. By contrast, Wells’ and SBSE charts foreground ecological and regenerative rigor and provide a structured platform for negotiating values, rather than certifying performance. The SBSE checklist, with its clear qualitative prompts and potential for negative scoring, occupies a unique pedagogical niche: it is simple enough to be used in a classroom, yet ambitious enough to stimulate discussion, critical thinking, and reflection on design priorities.

REFLECTIVE DESIGN PRAXIS

In *Tools for Ideas: Introduction to Architectural Design* Christian Gänshirt suggests that design education should not train students to conform to established criteria, but to critically reflect on how such criteria emerge, change, and conflict.¹⁵ In this sense, architectural design becomes a process of mediating between competing values rather than solving a single problem. This perspective informed the way the charts were introduced in the studio: not as evaluative scoring systems, but as tools for discussion and negotiation.

In this section we examine the application of both Wells’ and the SBSE chart within a semester-long architectural design studio with fifteen third-year undergraduate students. The studio was conducted three times a week and coordinated across multiple teaching units. Because of this shared structure, the original project brief was not conceived specifically for the purposes of this pedagogical experiment. However, as the semester unfolded, it became evident that the brief provided an unusually fertile context in which to test these charts as reflective design frameworks.

The studio project centered on the redevelopment of a vacant site in the Slabtown neighborhood of Portland, Oregon. The site, largely composed of cracked asphalt and sparse vegetation, was bordered by roads and surrounded by a dense urban fabric. The students were asked to collectively define a masterplan for the site and then individually design pavilions dedicated to collective community-oriented programs. While each student retained responsibility for their own building, all projects had to operate as part of a coherent spatial, ecological, and social strategy. From a technical and conceptual standpoint, the site strongly resonated with Malcolm Wells’ conception of the ideal site. His instructions on choosing a location were: “Improve the land when you build, or don’t build there”¹⁶ The absence of green infrastructure in the surrounding neighborhood further emphasized the urgency of transformation.

Wells’ *Wilderness-Based Chart* was introduced at the beginning of the semester as a conceptual and discursive tool. Engaging with Wells’ value system required students to temporarily set aside personal design intuition, instead prioritizing ethical and ecological considerations as the guiding logic for their projects. Students used the chart primarily to discuss the values outlined by Wells. This first engagement produced a wide range of interpretations and, importantly, a productive disagreement among students.

The chart was not introduced as a one-time analytical exercise, but as a recurring reflective device embedded in the rhythm of the studio. One of the three weekly class sessions was consistently dedicated to individual and collective reflection. At the beginning of the semester, students employed Wells' chart to articulate their initial values, intentions, and goals. Rather than starting with a formal concept, they were asked to define their intent—environmentally, socially, and experientially—and to position these ambitions within the chart. Many students described this phase as the development of a personal design manifesto, grounded not in style but in ethical and ecological commitments.

When the studio moved into the design phase, the pedagogical focus shifted from value discussion to design action. At this point, Wells' chart was replaced by the *Regeneration-Based Checklist*. The SBSE checklist offered students an updated and more operational vocabulary for translating abstract values into architectural strategies. The inclusion of prompts such as whether a building would be a “good or bad neighbor” shifted regeneration from a purely ecological concern to a civic and relational one, reinforcing the importance of mutual responsibility across the shared site.

During the design phase, the SBSE checklist was revisited weekly. Students used it to reassess their evolving projects, examining whether specific design decisions aligned with their stated goals and values. This iterative use transformed the chart into a dynamic feedback mechanism rather than a static framework. At the conclusion of the studio, students mapped their final projects onto the checklist and critically assessed the degree to which their original intentions had been realized, altered, or abandoned. At all three stages—beginning (Wells), middle (SBSE), and end (SBSE)—the charts were also used collectively to discuss shared values and to negotiate the priorities of the group as a whole.

Importantly, neither chart was graded. They were not treated as final products or representational outcomes, but as process-oriented instruments supporting reflective design thinking. While their consistent and thoughtful use was required, the content students placed within them was not evaluated. This reinforced the idea that the charts were means rather than ends—catalysts for critical awareness rather than performance metrics.

Working within a shared site proved to be crucial. Although each student developed an individual building, the collective masterplan forced them to confront the consequences of their design decisions beyond the boundaries of their own plots. Individual projects were repeatedly discussed as parts of a larger system, cultivating an understanding of architecture as relational rather than autonomous.

As the students engaged with the problems posed by the charts, several significant patterns emerged. One of the most striking was the gradual erosion of the conceptual boundary between architecture and landscape. This demanded an interdisciplinary mode of thinking that connected architecture with environmental science and landscape ecology. Students came to recognize that design is not merely the manipulation of form, but an active negotiation with complex natural processes.



Figure 3. Various design responses to the challenges posted by Wells' Wilderness. Student work by Rhys G., Alex T., Eliza M., Cadence G., Olivia F., Paul P.

This shift gave rise to an architectural language open to transformation. Rather than striving for fixed, iconic forms, many projects embraced irregular geometries and mutable surfaces shaped by site conditions. The charts' emphasis on the ground encouraged students to treat the earth not only as a structural or technical base, but as an active design medium. Vegetated façades and layered envelopes challenged the static quality of conventional renderings. In several projects, roofs extended into sloped terrains that merged with the surrounding ground, functioning simultaneously as circulation surfaces, social spaces, and ecological systems. (fig. 3) Students approached each value pair in the chart—such as air, water, energy and beauty—not as fixed criteria, but as design problems to be reinterpreted within the specific urban, social, and ecological conditions of the site.

CONCLUSION

By the end of the semester, students collectively populated the SBSE checklist with their design responses to specific challenges. The chart became a visual record of shared problem-solving. Individual projects appeared as interdependent contributions to a common field of inquiry. This process also revealed the difficulty of prioritizing collective values over personal preferences. Yet, in doing so, it exposed the limits of conventional design habits and highlighted the importance of adopting alternative value systems.

Ultimately, the combined use of Wells' *Wilderness-Based Chart* and the SBSE *Regeneration-Based Checklist* reframed the studio as a space of reflective practice rather than formal production. Design was approached not as the creation of isolated objects, but as a continuous ethical and ecological negotiation. Through the dialogue between these two charts—one rooted in ideological provocation, the other in regenerative pragmatism—students encountered a multiplicity of perspectives and learned to situate their architectural decisions within broader systems of value, responsibility, and change. The charts ultimately functioned as a negotiation table between architectural conventions and the values

brought to them by the students—between the discipline as a given framework and design as an act of continual re-contextualization.

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CREATIVE AGENCY AND PARALYSIS: NAVIGATING ATTENTION ECONOMICS IN CREATIVE PRACTICE PEDAGOGY

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INTRODUCTION

In the fifteen years I have been teaching creative practice at a tertiary level, I have heard two consistent responses from students which together complicate some key assumptions underpinning contemporary creative arts education. Students arrive with smartphones in hand, having spent years photographing, editing, and sharing images across digital platforms. They possess tablets with sophisticated applications and have a media literacy so ingrained it borders on innate. When I ask about both the analogue and digital aspects of their creative processes, they answer with two distinct yet related responses: 'I wasn't sure what to do next', and 'I don't really do digital art'.

These observations emerge primarily from my delivery of a second-year 'Open Studio' contemporary art practice program at an Australian university. I have adopted a reflective practice-led methodology in the below, meaning the information described derives from sustained classroom observations rather than systematic data collection, and that student behaviours, comments, and artworks have been generalised, paraphrased, and anonymised. While there are obvious epistemological limitations to this methodology, as an artist who is also an educator, I adopt it as the most familiar and appropriate approach to examine the rich ambiguities that emerge in both art teaching and art practice.¹

POSSIBILITY PARALYSIS

My core observation is that tertiary-level creative arts students routinely exhibit deeply paradoxical relationships with digital technology. I often hear declarations that computers hate them, even though digital devices are central to their every waking moment. Others insist they do not make digital art despite years of consuming, creating and distributing creative expressions online. This digital-ambivalence is often paired with a kind of digital naivety in how they undertake art practice.²

Previously, I had also naively considered this digital-avoidance to signal a knowledge deficit to be remedied by teaching specific skills. But as each cohort evolved from digitally disinterested to dismissive, it became difficult to deliver these skills on the promise of future relevance. Instead I've come to consider this intersection of digital-antagonism and digital-naivety as giving rise to a deficit of creative curiosity which leads to creative paralysis. Students frequently encounter creative opportunities and obstacles but rather than experimenting or seeking alternatives, they come to a standstill, and the 'what if?' question that drives practice becomes systematically stymied.³ For a discipline where curiosity is an essential generative force, this presents an existential problem.

PEDAGOGICAL CONTEXTS

A key part of how I work to foster creative curiosity is the Open Studio pedagogical model originating in Post-Studio classes at CalArts.⁴ Rather than prescribing specific media or techniques, the Open Studio prioritises heuristic conceptual development supported by educator-facilitated reflection on relationships between form and context. Knowledge emerges through rhizomatic connection rather than linear progression of predetermined competencies.⁵ However, while earlier in my teaching experience I would see this structure as prompting students to self-seek digital skills as a need arose, in the context of rising digital-ambivalence, my observation is this self-determination is becoming increasingly rare. It is as if this ambivalence that is characteristic of the post-digital era creates a catch-22: with students less likely to explore or develop digital skills precisely when creative paralysis and the atrophy of creative curiosity makes this more necessary than ever.⁶

In this context, I have returned to pedagogical concepts like Rancière's intellectual emancipation and McWilliam's 'meddler-in-the-middle' as crucial to the Open Studio.⁷ Instead of simply transmitting digital knowledge or contextual awareness to students to address the problem, I work as an educator alongside students, intervening by provoking inquiry rather than prescribing specific creative outcomes. What I have found difficult is that the heuristic essence of these ideas now meets digitally-ambivalent students already conditioned out of the curiosity such approaches presuppose.

DIGITAL NAIVETY AND INCURIOSITY

There are numerous commentaries countering the idea of contemporary students as 'digital natives'.⁸ Among these is my own suggestion that students might better be understood as 'digital naifs' – immersed in digital technology but not fluent in understanding how it operates practically, conceptually, or ideologically.⁹ This distinction matters because naivety specifically denotes not knowing what is not known, and this metacognitive absence combines with structural incuriosity to produce creative paralysis.

Somewhat like the fish in David Foster Wallace's parable who does not know what water is, digital naifs are so surrounded by technology they have not yet developed critical consideration of its operations.¹⁰ I think of students I have found to have laboriously marked out paintings by multiplying measurements from laptop screens rather than using a projector, or who were frustrated with how their cellophane lens filters limited their photography without having entertained post-processing. These kinds of examples also seem compounded by time-poverty and followed by pernicious creative stasis.

But I suggest this condition is structural rather than an individual failing. Many students are most familiar and comfortable with apps and browser-based software where the economics of walled gardens, and software subscription models limit and obscure underlying digital potentialities. Single-button functions and preset filters produce immediate effect but do little to prompt aesthetic consideration and sustained creative experimentation. Generative AI compounds this by combining infinite possibility in the simplest package. When single-function apps and generative outputs appear effortlessly complete, it rebuffs the 'why this?' and 'what's next?' questions on which creative development depends. Convenience and completeness breeds incuriosity.

ATTENTION, ASSESSMENT, AND INCURIOSITY

The incuriosity of digital naivety is compounded by broader cultural conditions which systematically undermine our capacity for sustained creative engagement. Platform capitalism's monetisation of attention fragments our attention into units optimised for advertising rather than meaningful experience.¹¹ Most new students arriving in tertiary classrooms have been shaped by these conditions since childhood, so incuriosity and creative paralysis are effectively structurally induced.

In the tertiary art studio, creative paralysis is precipitated by platform-centric content-creation-culture which now stands to be accelerated by generative AI. The promise of endless consumption has a negative effect on students' curiosity and heuristic development.¹² When algorithms predict wants before they are consciously formulated, the practice of self-reflection and asking questions diminishes. Incuriosity becomes systematically conditioned. Berardi articulates the psychological costs with alarming clarity; continuous acceleration produces depression, anxiety, and existential misery.¹³ Similarly, Fisher observed this in his own students' struggle; when current conditions make imagining the future hopeless, even curiosity feels pointless.¹⁴

Art school students arrive having been systematically trained to find the most effective path to fulfilling criteria. When asked what they are curious about, they often respond with suspicion, perceiving the question as tangential to assessment completion. Connell describes this as the neoliberal cascade in education: market logics transforming learning from discovery into obstacle-clearing.¹⁵ Even when students metacognitively recognise their lack of curiosity, intrinsic motivation to develop this capacity runs distant second to extrinsic motivation to complete assessment efficiently.¹⁶ My suggestion is that subconscious awareness of this paradox drives students' expressions of creative paralysis. But recognising these conditions can change the pedagogical approach. Students are not unmotivated; they are exhausted by systems designed to deplete capacities creative practice requires. What may be required are interventions that create conditions for curiosity to re-emerge.

RECONDITIONING CURIOSITY: A THREE-STAGE FRAMEWORK

The framework below has emerged from practice-led observations rather than theoretical deduction. It represents a pedagogical approach I have adopted incrementally as I have evolved my thinking about creative paralysis. The three stages operate as overlapping dimensions, each fostering a distinct aspect of creative curiosity that has been systematically suppressed. These activities are incredibly commonplace, prototypical art-school activities, so my discussion of them here is merely to frame them together as responses to creative paralysis and curiosity re-conditioning.

Reflective Curiosity: Practice Mapping

The first stage fosters curiosity about the self. At the start of semester, students make a classic visual practice map under categories of form, process, content, and context. While documenting their interests, habits, and influences, students often initially compile simpler lists or segregate categories, so the specific request to connect interests as nodes in a rhizomatic map activates more metacognitive reflection. Connecting these dots is always important as it prompts students to reflect on whether familiar materials could have new relationships with different processes, old contexts with new ideas etcetera. Then, in one-on-one consultations between myself and each student, reviewing their map can also reveal further creative and conceptual blind-spots, particularly those characteristic of digital naivety.

When asking a student to tour me through their practice map, I take the opportunity to demonstrate the curiosity so valuable to practice, particularly in identifying and querying material and conceptual boundaries students can overlook. For example, when a map includes only painting media, questions about whether they take photographs can lead to reconsideration of thousands of images on a student's phone. When contextual references focus on canonical modernists, questions about contemporary practices found on Instagram can open conversations about canonisation, platforms, and value. When processes extend only as far as medium descriptors, questions about digital processes can uncover new creative potential in the student's everyday activities. Scrolling and 'like-ing' could be recast as latent habit of collecting; archiving posts on an Instagram grid as the curation of a body of work;

sharing images to group-chats as collaborative creative activity. All of these have the potential to then turn into new creative activity where it was previously overlooked.

The pedagogical value of this self-curiosity sometimes only reveals itself when students return to their maps during end-of-semester reflective writing. In one example, a student encouraged to see their very curated approach to Instagram selfies as a valid form of self-portraiture then began to creatively grapple with the racist and ageist dimensions of the beauty filters they used, pushing these into satirical and parodical territory. Another student realised they could reconstitute the hazy-night-out social media snapshots of their friends into ghostly anotype prints that faded like memories. These kinds of creative and conceptual discoveries are identified through discussing practice maps, but are explored and developed by students in ways that explicit instruction cannot achieve. The practice map becomes a tool for developing curiosity about oneself and the creative possibilities for expression within digitally saturated conditions.

Conceptual Curiosity: Prompting as Reflection

The second stage builds on practice-map conversations to foster curiosity about digital technology, particularly platforms designed to encourage unquestioned consumption rather than critical engagement. This is particularly useful when the kind of open-ended inquiry about the creative potential of digital spaces described above produces suspicion or anxiety in students, rather than an openness to digital exploration. In these moments, some students balk at Socratic questions, so instead I provide scaffolded art-making prompts that fulfill their requests for actionable direction, while still aiming to provoke reflective engagement with the very technologies I see as conditioning passivity.

These art-making prompts share a common structure. They begin with a digital space, form, or process students already engage with; request some kind of translation across media or contexts; and ask for reflective action on the outcomes. Examples include: 'Take your last text message and translate it into visual form; repeat until you want to say something different.' This prompts imaginative reconsideration of text(ing) as creative material and asks students to consider the subtext of everyday utterances. 'Screenshot the last Instagram post you liked; include the caption from the post above it; translate both into one new drawing or collage' disrupts the invisible interface affordances of the platform to erode the boundaries students often maintain between social media consumption and creative practice. 'Crop your last three phone photos; to each add a different lyric from your favourite song; post these somewhere public' collapses image-making, listening, and platform practices in ways that prompt reflection on creative and consumptive aspects of all three.

I see the effectiveness of these prompts partly in their digital specificity but more significantly in the productive friction they can create in practice. The gap between text message and visual translation cannot be crossed without conceptual work. Juxtaposing Instagram posts requests a reappraisal of the feed as both continuous and atomised experience. Students frequently resist these prompts, and this resistance is pedagogically valuable. Firstly, because these prompts are provided weekly, it upends a common complaint that the Open Studio is paralyzingly open. But further, when students reject the prompt in favour of another creative action, this represents success in that the prompt has generated creative momentum. There is also rich learning potential found as both prompt compliance or refusal can be met with follow up questions about why either emerged, modelling a cycle of self-reflective curiosity that can continue to contribute to the student's practice development.

Material Curiosity: Digital-to-Physical Commitment

The third stage fosters curiosity about the material possibilities of practice, creative ambition, and the value of sharing rather than hiding creative work. As mentioned in the introduction, even the digitally averse student often exhibits fondness for digital illustration apps like Procreate or phone-based photography. The problem is that digital files exist in perpetual revisability, an ever-modifiable feature that becomes a procrastination bug, and means digital creations are never definitively complete. Students explain they are unsure whether their digital drawings are finished, or uncertain what to do with accumulations of photographs. While artists frequently have a similar problem with analogue mediums, here digital fluidity produces a particular kind of creative paralysis that in its invisibility can be hard to shift. So in response, the intervention I have found most consistently effective is the simplest of questions, but one digital-naïfs often overlook: ‘What happens when you print that out?’

Printing digital files to physical form is an act of creative commitment that expands curiosity in numerous ways. It introduces literal dimensions that infinite digital revision cannot provide and can reveal need for specific digital and analogue skills. Printing requires shifts in scale and medium that invite changes in perception and ambition. For example, a phone image becomes larger and tactile when printed, but students can also realise technical limitations – how apps default to screen-resolution, how differently colours look on reflective paper than through an emissive screen. Tactility also introduces different registers of value: the labour of printing, the precious material presence of different substrates, the reward of finding the right hanging method to underscore these kinds of value. A print demands observations and decisions that feel significantly different to when an image remains bound within a digital device.

In response to this simple question, students with digital image archives and Procreate files that had lived out of sight for months have discovered, when printed, that physical presence demands further technical and creative responses that in turn lead to conceptual realisations. Students making small test prints of their low-resolution drawings have self-instigated learning about DPI and vectorisation. Screen-capped text-chains of a blossoming relationship have become room-scale wallpapers spilling onto the gallery floor like effusive emotions. iPad illustrations have become translucent window films that bathe a communal space in a warm glow. Understated matte print surfaces have been queered with holographic films to dazzlingly effect. Even fragments of failed prints have been recycled into new satisfyingly tactile analogue collages. A student encouraged to print camera phone tests then systematically produced a curated photobook communicating more of the strange beauty in mundane snapshots than the phone-bound camera roll ever could. Another started printing and then laser-etching their favourite heartbroken poetry onto acrylic, which cast ghostly shadows of loss on the gallery walls – a material realisation impossible to arrive at if they had remained in the digital realm.

Asking students to print is not rejection of digital-centric practice, but an invitation to find new realisations through materialisation. This pedagogy provides students opportunity to become critically conscious of digitality as a crucial but not the sole constitutive dimension of contemporary experience.¹⁷ The movement from digital to physical creates conditions for reflection by raising the stakes materially in ways that digital fluidity defers or precludes. Perhaps most crucially, the simple act of printing changes the nature of sharing work with others in both real but also potentially unfinished form, rather than endlessly deferring completion. This can provide for students a real sense of momentum and creative agency in their practice and allows for the provision of more actionable classroom feedback from peers and educators.

POST-DIGITAL PEDAGOGY AND INSTITUTIONAL STAKES

This framework operates within what Tavin, Kolb, and Tervo term ‘post-digital pedagogy’.¹⁸ It puts into practice the digital ambivalence students express – that digital technology is neither something to flee nor embrace without question. It cultivates critical consciousness about the digital as it already operates. It supports students curiosity to grapple with, as art theorist Claire Bishop put it, “what it means to think, see, and filter affect through the digital.”¹⁹ Practice mapping, platform experimentation, and digital printing scaffold students' grappling with the digital world in which they are steeped. This approach mirrors what artist and writer Jenny Odell describes as a ‘hybrid reaction’ to attention-economy conditions – neither pure rejection nor uncritical acceptance but capacity to contemplate and participate simultaneously.²⁰

Each stage addresses specific dimensions of conditioned incuriosity. Practice mapping counters digital naivety by making hidden assumptions visible. Prompting counters convenience-induced passivity by forcing intentional engagement with platforms designed to discourage questioning. Material commitment counters exhaustion by re-introducing the tactile stakes of sharing physical experiences. Each intervention is notably simple; foregrounding the presence, attention, and openness to serendipitous outcomes that synchronous, embodied pedagogy enables.

Unfortunately, these approaches can be precluded by institutional conditions. The same attention-economy logics producing creative paralysis increasingly shape tertiary education itself. Institutions prioritising asynchronous, online-only learning risk compounding these very conditions. Policies of flexible delivery, reduced class time, and assessment-driven curricula may misread symptoms as causes: interpreting student disengagement as an indictment of current pedagogical offerings rather than as symptoms of the broader exhaustion those offerings could ameliorate.

Yet these observations also demonstrate that curiosity rekindled can generate encouraging outcomes. Students who map creative impulses can realise rich potential in their cultural interests. Those who look creatively at their camera roll can change how they relate to the infinite scroll. Artists committing something to print can uncover something new to be shared. Out of this approach can come students who, rather than declaring computers hate them, can begin to ‘imagine otherwise’ about how we relate to and through digital spaces.²¹ If the antidote to creative paralysis is curiosity, the antidote to exhaustion might be meaningful work, and the antidote to hopelessness, making something real, even if it starts as a print. As Rancière might suggest, creative agency cannot be given, only discovered, and the same could be said of curiosity.²² As educators, we cannot simply give students the appetite for exploration creative practice requires, but we can refuse complicity in its suppression and create spaces where it can re-emerge.

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DESIGN AS A COMPANION PRACTICE: CULTIVATING SELF-RELIANCE AMID MARKET DEMANDS

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INTRODUCTION

*“To believe your own thought, to believe that what is true for you in your private heart is true for all,—that is genius.”—Ralph Waldo Emerson, *Self-Reliance*¹*

Preface

The author entered the design field at a time when graphic design was not yet a formal academic discipline, when professional identity was shaped not by standardized curricula but by hands-on apprenticeship and a humanities-rich upbringing. Childhood memories were filled with the smell of rubber cement, the weight of layout boards, and the sharp slice of X-Acto blades. Advertising and product design were understood as pathways to social mobility; designers worked with markers, vellum, paste-ups, and mechanicals—transforming ideas into persuasive visual artifacts through meticulous, embodied craft.

When early personal computers arrived, the author immediately gravitated toward them. Though primitive, they opened new avenues for creative experimentation and professional access. For a period, technological expansion seemed to widen design’s possibilities.

The *AIGA Design Futures* reports reveal how much that landscape has since shifted. In “Introduction to Design Futures,” Meredith Davis notes that rapid technological acceleration, automation, and shifting labor structures have produced design roles that “bear little resemblance to the work for which many faculty were educated,” signaling a volatile and continually reshaped employment environment.² Likewise, “Core Values Matter” emphasizes that contemporary design is judged not only by aesthetic execution but by the ethical coherence, transparency, and value alignment of the systems designers help create.³ Together, these documents highlight a profession marked by turbulence: economic pressures, rapid tool obsolescence, new forms of specialization, and rising cultural expectations of social responsibility.

In such a climate, designers require more than technical fluency. They need a practice of reflection that can anchor them amid constant change. Emerson’s philosophy offers such grounding. Rather than urging self-confidence without scrutiny, *Self-Reliance* invites practitioners to cultivate inward clarity and ethical steadiness. Emerson urges us to become self-reliant by embracing core ideas, ethical clarity, and critical thinking as durable resources—resources capable of sustaining creative agency even when external conditions shift.⁴

This orientation aligns directly with the pedagogical model developed here, which frames design as a lifelong reflective discipline rather than a collection of technical competencies. When designers learn

to articulate their values, interrogate their decisions, and cultivate authorship, they are better equipped to navigate the volatility identified by AIGA and to contribute meaningfully within an ever-shifting profession.

An Pedagogical Model of Meaning-Making

This paper proposes an alternative pedagogical model, *Design as a Companion Practice*, which reframes design not simply as professional preparation but as a lifelong discipline of meaning-making. Grounded in Ralph Waldo Emerson's "Self-Reliance," this approach emphasizes reflective practice, personal authorship, and long-term adaptability as central to the outcomes of design education. Emerson's insistence on cultivating one's own voice—"Trust thyself: every heart vibrates to that iron string" speaks directly to the conditions faced by contemporary design students, who must navigate environments increasingly structured by algorithms, automation, and standardized workflows. His critique of conformity and celebration of independent judgment provide a vocabulary for rethinking design pedagogy in an age that simultaneously demands creativity and rewards compliance.⁵

The argument is further developed through examples from a Writing in the Disciplines (WID) course for Graphic/Information Design, in which writing and design operate as parallel modes of inquiry. In this course, students produce research-driven visual essays and monographs that require iterative drafting, critical reflection, and typographic authorship. Writing becomes a mechanism through which students articulate values, interrogate assumptions, and cultivate the self-reliance Emerson champions. In turn, design becomes a reflective, ethical, and epistemic practice—one capable of engaging cultural, technological, and economic volatility with integrity.⁶

Ultimately, preparing students for the design profession requires preparing them for a creative life beyond it. Companion practice fosters the inner resources—voice, resilience, ethical clarity—that enable designers to navigate uncertainty and sustain imaginative engagement across changing contexts. In doing so, it offers a human-centered expansion of market relevance rather than a rejection of it.

HISTORICAL AND PHILOSOPHICAL CONTEXT

Design has always existed in a dynamic relationship with markets, technologies, and cultural systems. From the industrial revolution to the present moment, design both responds to economic forces and actively shapes them—commercializing new forms of communication, transforming consumer culture, and mediating interactions between people and emerging technologies. Yet as design became formalized within higher education and professionalized through industry standards, its pedagogical models increasingly oriented themselves toward employability, efficiency, and client-centered production.⁷ These models often emphasize speed, technical execution, and measurable outputs, framing design students as future workers rather than as reflective thinkers, cultural interpreters, or ethical agents.

This market-centric orientation has intensified in the 21st century as design schools respond to industry demands for proficiency in rapidly evolving tools and workflows. AI-assisted image generation, automated layout systems, and platform-driven production pipelines have reshaped expectations of what designers should know and how quickly they should learn it. While these shifts create new opportunities, they also risk reducing design education to a technical service pipeline and obscuring design's intellectual, ethical, and cultural dimensions. As Victor Papanek argued more than half a century ago, when design education centers the marketplace above human and ecological concerns, it risks producing technicians rather than responsible creators.⁸

Against this backdrop, the philosophical framework of Ralph Waldo Emerson’s “Self-Reliance” provides a compelling counterpoint. Emerson advances a vision of education grounded in personal integrity, attentiveness, and inward authorship—an ethos that challenges conformity, passive obedience, and the “joint-stock company” of societal expectation.⁹ His declaration that “Imitation is suicide” and his insistence on trusting one’s own perceptions articulate an intellectual stance that resonates strongly with the needs of contemporary design students, who must develop not only technical fluency but the capacity to interpret, critique, and navigate complex sociotechnical landscapes.

Moreover, Emerson’s conception of continuous becoming—“Life only avails, not the having lived”—aligns with the iterative, reflective, and lifelong nature of design practice. As Schön¹⁰ argues, professional knowledge emerges not from rote application of procedures but from reflective, situated engagement with uncertainty. Emerson’s philosophy enriches this pedagogical perspective by emphasizing the ethical and existential stakes of such reflection: to act authentically, to cultivate voice, and to remain responsive to one’s internal and external worlds.

Taken together, these historical and philosophical threads reveal a tension at the heart of contemporary design education: between design as labor and design as inquiry, between external metrics and internal agency, between conformity and creative independence. This tension sets the stage for a reimagined design pedagogy—one that reconnects technical preparation to reflective practice, ethical judgment, and the cultivation of self-reliance.

DESIGN AS A COMPANION PRACTICE

Contemporary design education often frames design as a sequence of competences to be mastered—software workflows, industry tools, production pipelines, and client-facing deliverables. Yet this emphasis on technical skill acquisition obscures the deeper intellectual and ethical dimensions of design as a way of engaging with the world. To counter this, I propose the concept of Design as a Companion Practice: a lifelong, reflective orientation in which design functions not only as a profession but as a mode of thinking, observing, and making meaning. This framework positions design as something that grows with the individual—an evolving companion rather than a static body of knowledge.

At the core of companion practice are three interrelated pillars: reflective practice, self-reliance, and long-term adaptability. Each responds to historical tendencies in design pedagogy while aligning with contemporary needs.

Gaining knowledge through a reflective practice

The first pillar, **reflective practice**, draws on Schön’s¹¹ insight that professional knowledge emerges through iterative cycles of action and reflection. Reflection is not an external commentary on design work; it is integral to the work itself. When students write about their process, annotate iterations, or articulate design decisions, they develop the metacognitive capacity to see how their assumptions, values, and interpretations shape their design outcomes. This aligns with Dewey’s¹² view of reflection as disciplined inquiry—a habit of mind that enables learners to navigate uncertainty with intention rather than reactively.

Trusting yourself builds self-reliance

The second pillar, **self-reliance**, builds on Emerson’s call to “trust thyself.”¹³ In the context of design education, self-reliance is not individualistic isolation but an ethical stance grounded in authorship, judgment, and voice. Emerson’s warning that “Imitation is suicide” resonates strongly within studio environments where students often look to trends, templates, and external validation for direction. A

companion practice framework positions self-reliance as the cultivation of internal authorship: the capacity to originate ideas, resist passive conformity, and engage critically with both tools and cultural expectations. This becomes increasingly vital as AI-driven systems blur authorship and automate stylistic choices, pushing designers to reaffirm their interpretive and ethical agency.

Negotiating volatility through long-term adaptability

The third pillar, **long-term adaptability**, addresses the conditions of volatility that shape 21st-century design work. As Nelson and Stolterman¹⁴ argue, design is fundamentally concerned with intentional change under conditions of complexity. Adaptability in this context is not merely the ability to switch tools or workflows; it is the resilience to continually renegotiate one's relationship to evolving technologies, cultural shifts, and professional demands. A companion practice nurtures this adaptability by framing design as a living discipline: something that accompanies the designer through transformations in identity, career, and context.

Together, these pillars reposition design education from a narrow training model to a holistic, human-centered pedagogy. Rather than preparing students only for immediate employment, companion practice cultivates the intellectual, emotional, and ethical resources needed to sustain a creative life. It reconnects technical skill with reflective judgment, market relevance with personal integrity, and professional adaptability with lifelong learning. In doing so, design becomes not simply a career path but a meaningful practice of continual becoming.

WRITING AS DESIGN THINKING: CULTIVATING SELF-RELIANCE THROUGH REFLECTIVE INQUIRY

While design is often described as a visual discipline, the cognitive processes that underlie design practice—interpretation, evaluation, judgment, and revision—are equally linguistic.

Writing externalizes these processes and gives them form. In this sense, writing is not adjacent to design; it is a mode of **design thinking**. When students write about their work, articulate their values, or craft arguments about visual form, they engage in the same conceptual practices required in layout, typographic hierarchy, or systems design. Writing is where designers learn to see how they think.

This relationship becomes especially important when considering reflective practice. Schön's¹⁵ work on the "reflective practitioner" demonstrates that designers make meaning through cycles of action and reflection. They move fluidly between doing and thinking, adjusting their approach based on insights gleaned in the moment of making. Writing strengthens this cycle by providing a parallel site of inquiry in which ideas can be tested, clarified, and revised. As Dewey¹⁶ argues, reflection is a discipline: a conscious effort to connect experience, analysis, and consequence. Writing makes this discipline visible. It gives students the language to understand not only what they are designing, but why they are designing it—and what their decisions communicate.

Believe in Your Own Thought to Cultivate "Self-Reliance"

In this sense, writing becomes a tool for cultivating **self-reliance** in the Emersonian sense. Emerson urges readers to "believe [their] own thought" and to trust the insights that arise from direct experience.¹⁷ Writing helps students develop this trust. When students must describe their design decisions, defend their choices, or articulate their critique of a precedent, they begin to hear themselves as authors. This process counters the tendency toward passive conformity that can emerge in studio culture, where students often look to peers, faculty, or industry templates for direction. Through writing, students cultivate an internal voice—one capable of grounding design decisions in personal ethics, cultural awareness, and critical interpretation.

Using Lived Experience to Develop “Ethical Authorship”

Writing also supports the development of **ethical authorship**, particularly as design roles evolve alongside AI-driven tools and automated workflows. In a landscape where stylistic mimicry can be completed by machines, reflective writing prompts students to identify the values, perspectives, and lived experiences that machines cannot replicate. Writing helps them articulate the difference between surface-level visual output and meaningful design intention. In doing so, it becomes a mode of epistemic self-defense: a way for designers to assert authorship, integrity, and accountability in environments that increasingly foreground speed and automation.¹⁸

Moreover, writing offers a means of synthesizing complex contexts—cultural, technological, and social—into coherent narratives that can guide design action. As Nelson and Stolterman¹⁹ note, design judgment emerges from the ability to make sense of situations that resist easy categorization. Writing is one of the few pedagogical tools capable of supporting this sensemaking. It enables students to connect disciplinary knowledge, personal experience, and ethical considerations, transforming design into a reflective and interpretive practice rather than a purely technical one.

Learning to Write as a “Companion Practice”

In this way, writing becomes a central mechanism in a **companion practice** framework. It nurtures voice, clarity, self-reliance, and ethical awareness—qualities essential not only for successful projects, but for sustaining a creative life. When writing is integrated into design curricula not as an external requirement but as a parallel design process, students gain the reflective tools needed to navigate volatility, resist conformity, and engage design as a lifelong mode of becoming.

THE WRITING IN THE DISCIPLINES (WID) COURSE

The Writing in the Disciplines (WID) course for Graphic/Information Design provides a lived example of how a companion practice can be enacted pedagogically. Designed as a 16-week sequence integrating research, writing, critique, and typographic authorship, the course positions writing and design as parallel, mutually reinforcing processes of inquiry. The curriculum moves students through four iterative phases—research, drafting, visual integration, and publication—each structured to support reflective practice, cultivate self-reliance, and develop long-term adaptability.

Research as Identity Formation

The first phase requires students to select a research topic that intersects personal interest, design history, and contemporary cultural issues. Drawing on Muratovski’s²⁰ methodological guidance, students develop annotated bibliographies, refine research questions, and frame contexts of inquiry. Rather than approaching research as an obligation, students encounter it as a form of self-authorship: they must articulate not only what they want to study but why it matters. This early stage prompts them to situate themselves within the discipline—to enter what Emerson calls the “conversation” between one’s own thought and the world.²¹ Research thus becomes a moment of identity formation, shaping the student’s emerging voice as both thinker and designer.

Drafting as Reflective Dialogue

In the drafting phase, students produce iterative written explorations of their topics, supported by peer review and weekly feedback. Here, Schön’s²² “reflection-in-action” becomes pedagogically visible. Students learn to articulate their design decisions, critique precedents, and trace how their ideas evolve. Writing, in this stage, functions as a dialogic partner. As they compose and revise, students externalize their thinking, test assumptions, and clarify their ethical stance. Peer critique sessions

reinforce Emerson's call to resist passive conformity: students must defend their choices, question the work of others, and respond to critique without surrendering their authorship.

Visual Integration: Writing as Typographic and Spatial Argument

The third phase, visual integration, is where writing becomes design. Students bring their drafts into Adobe InDesign and begin to construct the layout of a research monograph. This transition requires them to translate textual logic into typographic hierarchy, spatial rhythm, and visual structure.²³ The layout process emphasizes that design is not decoration but a form of reasoning—an argument made visible. Students quickly recognize that typographic decisions carry conceptual weight: choices about spacing, alignment, emphasis, and figure integration all shape how the argument is read, interpreted, and felt.

This stage can produce moments of ethical and aesthetic transformation. For example, a student researching mental-health visualizations might rewrite and redesigned entire sections of a project after realizing—through writing—that the initial approach risked sensationalizing trauma. The revised monograph could embody a quieter, more intentional typographic voice, illustrating how reflective writing can directly reshape visual ethics. This alignment of thought, form, and value exemplifies the companion practice framework: design thinking emerges through recursive movement between writing and making.

Publication: Claiming Voice and Authorship

The final phase culminates in a fully designed, printed, and bound monograph, presented to a faculty panel. The act of publication is pedagogically significant. It requires students to step into authorship—to claim their argument, design decisions, and voice in a public form. This is what Emerson describes as the moment when “a man is relieved and gay when he has put his heart into his work and done his best.” For many students, the printed monograph is their first sustained piece of design scholarship; it marks a shift from viewing themselves as learners to viewing themselves as contributors to the field.²⁴

Outcomes: Self-Reliance, Reflection, and Resilience

Across cohorts, the WID course will yield consistent outcomes. Students gain confidence in articulating their ideas, realize greater clarity about their values, and develop a deeper understanding of how writing and design inform one another. The monographs produced in the course demonstrate enhanced critical rigor, ethical awareness, and conceptual depth. These outcomes reaffirm Nelson and Stolterman's²⁵ assertion that design judgment develops through reflective, situated engagement rather than through technical training alone.

In other words, the WID course becomes a microcosm of companion practice. It demonstrates how structured reflective writing can cultivate Emersonian self-reliance, and how integrating writing into studio pedagogy produces designers capable of navigating complexity, uncertainty, and technological change with groundedness and imagination.

IMPLICATIONS FOR DESIGN EDUCATION AND PRACTICE

The companion practice framework carries several significant implications for the future of design education, particularly as programs navigate increasingly complex intersections of technology, culture, and ethics. At its core, this framework shifts design pedagogy from a training paradigm—focused on proficiency and output—toward a reflective, inquiry-driven model that prepares students to navigate uncertainty with agency and integrity.

From Production to Inquiry

One of the most urgent implications is the need to reposition design education away from an exclusive emphasis on production. When design curricula center on efficiency, compliance with briefs, or tool-based outcomes, students may become technically capable but conceptually underdeveloped. As Papanek²⁶ and Frascara²⁷ both argue, such a narrow model overlooks design's broader social, intellectual, and ethical responsibilities. A companion practice restores inquiry as the foundation of design, teaching students to frame problems, articulate values, and understand the cultural and technological conditions shaping their work. This approach aligns with Nelson and Stolterman's²⁸ insistence that design judgment—not tool mastery—is what ultimately sustains professional and creative longevity.

Preparing Students for Volatility

The rapid evolution of digital tools, automation, and AI-driven systems demands that designers cultivate adaptability. Yet adaptability alone is insufficient without reflective grounding; otherwise, designers risk becoming reactive rather than intentional. The companion practice model equips students to orient themselves amid rapid technological change, encouraging what Schön²⁹ calls a “reflective conversation with materials”—whether those materials are analog, digital, or algorithmic. By fostering self-reliance and reflection, design programs can prepare graduates not only to adjust to new conditions but to participate in shaping the future of design practice.

Ethical and Epistemic Dimensions

Designers increasingly work in contexts where ethical judgment is essential—whether designing interfaces, visualizing data, or participating in community-based projects. A companion practice emphasizes ethical authorship by asking students to articulate their values and consider the implications of their decisions. In this way, reflective writing and design serve as tools for developing what Costanza-Chock³⁰ terms “design justice”: a framework that prioritizes community-led knowledge and equitable design processes. Integrating companion practice thus helps prevent design from becoming a neutral mediator of harmful structures, instead fostering designers capable of ethical critique and socially responsive practice.

Institutional Fit and Future Directions

Finally, the companion practice framework aligns with broader institutional goals related to creativity, civic engagement, and adaptability—priorities outlined in university strategic plans such as CCSU's SP2030. By embedding writing, reflection, and authorship into studio pedagogy, design programs can cultivate a culture that values intellectual rigor, cross-disciplinary inquiry, and community-centered approaches. These pedagogical commitments position design not as a technical appendage to other fields but as a discipline capable of contributing meaningfully to public discourse, research, and social transformation.

CONCLUSION

Designers enter a landscape marked by rapid technological change, fluctuating job structures, and increasing ethical scrutiny—conditions foregrounded in the AIGA *Design Futures* reports, which describe an employment terrain continually reshaped by automation, specialization, and shifting cultural expectations.³¹ In this volatile environment, traditional models of design education risk offering too little: technical skills without grounding, efficiency without reflection, and employability without long-term adaptability.

The framework of “Design as a Companion Practice” responds directly to this turbulence. Rather than preparing students solely for immediate professional demands, it cultivates the inward resources necessary to navigate change with agency and clarity. Through reflective writing, critical inquiry, and authorship, students learn to articulate their values, examine their assumptions, and confront the ethical implications of their choices. This orientation aligns with Schön’s³² conception of the reflective practitioner, Dewey’s³³ understanding of disciplined inquiry, and Nelson and Stolterman’s³⁴ argument that design judgment grows from situated engagement rather than mechanical procedure.

This framework also resonates deeply with Emerson’s philosophy. As the Preface notes, *Self-Reliance* is not a plea for isolation but an invitation to cultivate an internal steadiness capable of withstanding external turbulence. Emerson writes that “nothing can bring you peace but yourself. Nothing can bring you peace but the triumph of principles,” emphasizing that enduring stability arises not from markets or tools but from the cultivation of durable inner resources.³⁵ Companion practice embodies this insight: it encourages designers to recognize the continuity between reflection and action, thought and form, ethics and practice.

In this sense, the purpose of design education extends beyond preparing students for a first job. It prepares them for a creative life—one that will span multiple roles, tools, technologies, and socio-cultural conditions. A designer grounded in reflective practice and self-reliance can remain adaptable without becoming reactive, principled without becoming rigid, and imaginative even in times of constraint. These qualities are essential in a profession where, as Davis observes, the landscape “bears little resemblance to the work for which many faculty were educated.”³⁶

As the field continues to evolve at a pace that defies prediction, design educators face a heightened responsibility: to cultivate the habits of mind that allow emerging designers to orient themselves within ongoing change. “Design as a Companion Practice” offers one pathway toward this goal—a pedagogy that roots technical skill in reflective inquiry, situates professional readiness within ethical clarity, and positions design not as a transient career but as a lifelong discipline of becoming.

NOTES

- ¹ Ralph Waldo Emerson. *Essays: First Series*. Boston: James Munroe & Company, 1841.
- ² Meredith Davis, *Introduction to Design Futures* (New York: AIGA Design Futures, 2017), accessed December 9, 2025.
- ³ Meredith Davis, "Core Values Matter" (New York: AIGA Design Futures, 2017), accessed December 9, 2025, <https://www.aiga.org/>.
- ⁴ Emerson, *Essays*.
- ⁵ Emerson, *Essays*.
- ⁶ Donald A. Schön, *The Reflective Practitioner: How Professionals Think in Action* (New York: Basic Books, 1983); Nelson and Stolterman, *The Design Way*.
- ⁷ Jorge Frascara, *Communication Design: Principles, Methods, and Practice* (New York: Allworth Press, 2004).
- ⁸ Victor Papanek, *Design for the Real World: Human Ecology and Social Change* (New York: Pantheon Books, 1971).
- ⁹ Emerson, *Essays*, 50.
- ¹⁰ Schön, *The Reflective Practitioner*.
- ¹¹ Schön, *The Reflective Practitioner*.
- ¹² John Dewey, *How We Think* (Boston: D.C. Heath & Co., 1910).
- ¹³ Emerson, *Essays*, 45.
- ¹⁴ Nelson and Stolterman, *The Design Way*.
- ¹⁵ Schön, *The Reflective Practitioner*.
- ¹⁶ John Dewey, *How We Think* (Boston: D.C. Heath & Co., 1910).
- ¹⁷ Emerson, *Essays*.
- ¹⁸ Sasha Costanza-Chock, *Design Justice: Community-Led Practices to Build the Worlds We Need* (Cambridge, MA: MIT Press, 2020).
- ¹⁹ Nelson and Stolterman, *The Design Way*.
- ²⁰ Gjoko Muratovski, *Research for Designers: A Guide to Methods and Practice* (London: SAGE Publications, 2016).
- ²¹ Emerson, *Essays*.
- ²² Schön, *The Reflective Practitioner*.
- ²³ Ellen Lupton, *Thinking with Type: A Critical Guide for Designers, Writers, Editors, and Students*, 2nd rev. ed. (New York: Princeton Architectural Press, 2010).
- ²⁴ Emerson, *Essays*, 41.
- ²⁵ Nelson and Stolterman, *The Design Way*.
- ²⁶ Victor Papanek, *Design for the Real World*.
- ²⁷ Jorge Frascara, *Communication Design*.
- ²⁸ Nelson and Stolterman, *The Design Way*.
- ²⁹ Schön, *The Reflective Practitioner*.
- ³⁰ Sasha Costanza-Chock, *Design Justice*.
- ³¹ Meredith Davis, "Core Values Matter."; Meredith Davis, "Core Values Matter."
- ³² Donald A. Schön, *The Reflective Practitioner: How Professionals Think in Action* (New York: Basic Books, 1983).
- ³³ Dewey, *How We Think*.
- ³⁴ Nelson and Stolterman, *The Design Way*.
- ³⁵ Emerson, *Essays*, 95.
- ³⁶ Meredith Davis, "Core Values Matter."

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FROM LINEAR TO LIVING: A MANIFESTO FOR CYCLICAL ARTS EDUCATION THROUGH CYBERNETIC MAKING PRACTICE

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INTRODUCTION

Like most academics I know, I rarely sleep for more than a few uninterrupted hours at a time. It is often in the early hours, when administrative concerns recede, that more persistent questions surface. Over recent years, one question in particular has returned again and again, both privately and in conversations with teaching colleagues: why are students becoming increasingly reluctant to give or receive critique, and what does this hesitation mean for the development of a meaningful creative practice?

We found ourselves agreeing that this reluctance was having a noticeable impact. When students disengage from critique, creative work can become inward-facing and disconnected from audience, context, and society at large. Research and critical analysis- once understood as integral to making- are increasingly treated as optional or even burdensome. The experience of studentship, understood here as the process of becoming a reflective, responsive practitioner, risks being diminished when making is separated from inquiry.

Initially, it was tempting to attribute these issues to broader structural or generational shifts: changes in recruitment, rising tuition fees, altered social dynamics, or the rapid evolution of creative technologies. Yet this quickly led me to reflect more critically on my own role as an educator. What responsibility do we have to adapt our teaching methods rather than simply diagnosing problems elsewhere? And what assumptions about creativity, knowledge, and value are embedded within the systems we continue to reproduce?

These reflections led me toward a set of increasingly fundamental questions. Is creativity culture specific, and does it risk reinforcing dominant norms rather than challenging them? Has there been a loss of tactile connection with creative processes, what Karen Barad describes as intra-action, where knowledge emerges through material engagement with tools and environments?¹ And within a fee-paying system, are students positioned as scholars or customers- expected to perform, comply, and progress efficiently rather than question, resist, and explore? This is not simply a question of studio time or access to materials, though both matter. It is a question of how we understand the relationship between thinking and making. Barad's framework, developed through quantum physics and feminist theory, insists that knowing and being are not separate activities: to engage materially with the world is already to produce knowledge, and to withdraw from that engagement is to foreclose it. If students are increasingly positioned as consumers of taught content rather than co-producers of knowledge- a

shift driven as much by institutional risk-aversion as by individual choice- then the erosion of material engagement is not merely a stylistic loss. It is an epistemological one.

It was within this state of pedagogical uncertainty that I encountered the Roy Ascott Archive and Artworks, following a chance meeting with Claudia Ascott in rural Spain. At the time, I was unaware of the extent to which Roy Ascott's ideas had shaped my own teaching instincts. Yet as I began to explore his work, particularly his development of the Groundcourse at Ealing College of Art in the early 1960s- I was struck by how closely his concerns mirrored those troubling many arts educators today.²

This paper proposes that revisiting Ascott's cybernetic approach to arts education, understood as cyclical, participatory, and adaptive- offers a productive way of responding to contemporary challenges. Drawing on archival research, interviews with Roy and Claudia Ascott, and my own practice-led experimentation, I explore how tactile learning tools informed by cybernetic principles might support critical engagement, collaboration, and reflexivity. Rather than presenting a fixed pedagogical model, this paper argues for arts education as a living system, one capable of evolving through feedback, dialogue, and shared agency.

ROY ASCOTT, CYBERNETICS AND THE GROUND COURSE

Roy Ascott's pedagogical thinking emerged in post-war Britain, shaped by a period of rapid technological change and a growing interest in systems theory and behavioural science. In *The Construction of Change* (1964), Ascott called for a radical reimagining of arts education, arguing that art possesses value only when it enables mental transformation.³ For Ascott, art did not reside in the finished object but within behavioural processes- within the exchanges between people, materials, and environments.

Influenced by figures such as W. Ross Ashby and B. F. Skinner, Ascott became particularly interested in feedback loops: how actions produce responses, and how those responses in turn reshape future behaviour.⁴ He proposed that classrooms could function as creative systems, with students and tutors jointly responsible for shaping learning environments. Art schools, in this view, were not sites of transmission but organisms- adaptive, responsive, and unfinished.

Recent scholarship has helped to situate Ascott's pedagogical experiments more clearly within the cultural and intellectual conditions of post-war Britain. Kate Sloan's *Art, Cybernetics and Pedagogy in Post-War Britain* positions the Groundcourse not as an isolated innovation, but as part of a broader shift toward systems thinking, experimentation, and interdisciplinary exchange across art, science, and education during the period.⁵

These ideas were put into practice through the *Groundcourse*, an experimental Foundation programme trialled at Ealing College of Art between 1961 and 1964. The course foregrounded uncertainty, disruption, and lateral thinking through tasks that asked students to translate sensory experiences, emotions, or abstract concepts into material form. Exercises were often intentionally disorientating, designed to disrupt habitual responses and encourage curiosity, risk, and responsiveness.⁶

Two exercises in particular, both documented in the archive and discussed at length in my conversations with Roy and Claudia Ascott, have proven especially generative as points of departure for my own practice.

The first involved asking students to construct a physical model of a relationship: not a relationship between objects, but between people, or between a person and an emotion, or between two ideas that resist easy conjunction. The task resisted illustration from the outset; there was no correct material answer, only the quality of the thinking made visible. What students produced, Roy recalled, was less

interesting than how they defended and revised it under questioning- the object became a prop for dialogue rather than an endpoint.

The second exercise required students to document a journey using only non-visual means: sound, temperature, texture, weight. The instruction forced attention onto the embodied, pre-cognitive dimensions of experience that conventional studio practice often bypasses. Both exercises share a common logic: they use constraint and unfamiliarity to break habitual responses and create the conditions for genuine inquiry. This logic- that productive disruption can open rather than close down thinking- runs directly through the cyclical workshop model proposed here, and through the tactile learning tools developed as part of this research.⁷

FROM ARCHIVE TO PRACTICE: TACTILE LEARNING TOOLS

Engagement with the Ascott Archive led to an extended dialogue with Roy and Claudia Ascott, including a face-to-face interview in July 2024 that now forms the basis of an evolving video essay. These conversations offered personal insight into Roy's motivations and working methods, particularly his enduring commitment to collaboration, tactility, and performance as modes of thinking rather than embellishments to finished work.⁸

At the same time, my own creative practice was undergoing a shift away from screen-based media toward object-based, performative, and installation work. Conversations with colleagues and peers echoed this movement, revealing shared concerns around the erosion of material engagement within arts education.⁹

From this convergence emerged the idea of developing tactile learning tools- cards, games, or kinetic objects- that could be co-designed with participants and continually adapted through use. These tools are not conceived as solutions, but as provocations: devices that surface tensions, invite dialogue, and reframe critique as a shared inquiry rather than a judgement.

Three practical tools and approaches have emerged from this process, each informed by a different aspect of Ascott's cybernetic thinking and shaped through iterative use with participants.

The first is the *Lateral Deck*: currently 20 prompt cards, each pairing an abstract concept with an instruction for material action. A card might read: *translate anxiety into weight, or make something that could argue with itself*. Derived loosely from the translation exercises at the heart of the Groundcourse, these cards are designed to disrupt the tendency toward illustration - the habit of making something that simply depicts an idea rather than enacts it. Participants draw cards individually, then negotiate their responses with a partner before making anything, a step that introduces dialogue and friction from the outset.

The second is part of an activity named *The Satisfactory*, developed with UG Visual Communication staff and students (so named because 'satisfactory' is the indicative language used during assessment for a threshold pass). Students are asked to respond to a product or packaging design brief and ensure the concepts are as mediocre, obvious and downright boring as possible. Working collaboratively, they aim for something bland but often invertedly devise unusual and unique ideas- this is due in part to the teams approaching the task with humour, a sense of curiosity – free from fear of critique. The activity can be developed by asking students to 'make the output even worse and less interesting' which opens up more honest critical peer dialogue as participants become less precious about the outcomes and become instead embroiled in a discursive, explorative process. This activity also lends itself to incorporating tactile 'tokens', small discs with imprinted symbols, which can be exchanged silently between students during the research and development process. Use of the tokens can signal responses to one another's work. Rather than being evaluative, the symbols indicate questions or prompts for critical thought. Instead of casting judgements, the process directs attention toward uncertainty, tension, or potential rather than quality. The tokens are particularly useful for students

who are less comfortable in discursive situations. The token system borrows from Ascott's interest in non-verbal communication and from game design's use of tangible affordances, but its purpose is ultimately pedagogical: to lower the threshold for critical exchange by replacing verbal critique with a physical gesture. Students who consistently withdrew from group discussion found it possible, and eventually preferable, to begin critique through this material register before moving into spoken dialogue.

The third category is currently more provisional: a set of *Constraint Objects*- asymmetric weights, mirrors of different curvatures, tools modified to perform differently than expected- intended to introduce productive resistance into the making process. These are less developed than the cards and discs, and their use remains exploratory. They draw on Karen Barad's notion that knowledge emerges not from instruments acting upon passive matter, but from the intra-action between the two: an understanding that tools and materials co-produce meaning rather than simply transmitting it.¹⁰ The *Constraint Objects* are designed to make this intra-action felt rather than theorised.

All three sets of tools/approaches are designed to be co-adapted: participants are invited to modify, annotate, or replace individual cards, tokens, or objects in response to what they discover through use. In this sense, the tools are themselves subject to the cybernetic loop they are intended to enact- each iteration of use generates feedback that shapes the next version.

LINEAR AND CYCLICAL PEDAGOGICAL MODELS

Many of the challenges encountered in contemporary arts education stem from the persistence of linear structures within higher education. Research is expected to progress neatly from aim to method to outcome, privileging written articulation, individual authorship, and measurable outputs. Such frameworks often struggle to accommodate the recursive nature of creative practice and tend to favour economically stable, neurotypical learners.¹¹

In contrast, a cyclical approach aligned with cybernetic thinking embraces uncertainty, iteration, and adaptation. Learning unfolds through feedback rather than progression, allowing questions to emerge through practice rather than being fixed in advance. Gregory Bateson describes this as deutero-learning: learning about how learning itself occurs.¹²

The dominance of linear models in UK higher education is not incidental. It reflects the consolidation of audit culture - what Henk Borgdorff has described as the tendency of institutions to render knowledge claims legible through the frameworks of natural science and the accompanying pressure on arts disciplines to demonstrate value in measurable, transferable terms.¹³ In this context, the cyclical, non-cumulative nature of creative inquiry becomes not merely pedagogically awkward but administratively suspect.

The consequences are unevenly distributed. Linear assessment structures disproportionately disadvantage learners whose thinking processes do not map neatly onto sequential frameworks: students with ADHD or dyslexia, for whom iterative, associative modes of working are not compensatory strategies but primary cognitive strengths; international students navigating unfamiliar critical conventions; students from backgrounds where the conventions of academic discourse were never modelled. A cyclical approach, by contrast, treats recursion and non-linearity as features rather than failures, as evidence of a thinking practice that is responsive, adaptive, and genuinely engaged with uncertainty. In this sense, the argument for cyclical pedagogy is not only epistemological. It is also one of equity.

A CYCLICAL WORKSHOP MODEL

The cyclical workshop model proposed here is informed by cybernetic principles but grounded in practical, embodied teaching situations. Rather than functioning as a sequence of tasks leading toward a predefined outcome, the workshop operates as a responsive system in which learning emerges through interaction, feedback, and iteration. Its structure is deliberately open, allowing participants to shape both the process and its direction over time.

Human Action & Engagement

Workshops would typically begin with engagement through making. Participants are introduced to a set of tactile learning tools- such as cards, prompts, or simple objects- designed to provoke discussion and action rather than provide instruction. These tools act as catalysts, inviting participants to respond intuitively and materially rather than analytically in the first instance. The emphasis at this stage is on participation and attentiveness rather than production. Making is framed not as a means to an end, but as a way of entering into dialogue with materials, peers, and the environment.

Environmental Feedback

As participants work, feedback begins to emerge organically. This feedback may take multiple forms: resistance from materials, unexpected interpretations by peers, or tensions between intention and outcome. Importantly, feedback is not delivered hierarchically. There is no formal critique at this stage; instead, responses are allowed to surface through observation, conversation, and shared experience. In this sense, feedback is understood not as evaluation but as information- signals within the system that indicate where attention might be directed next.

Reflective Interpretation

The next phase involves collective reflection, where these signals are made visible and discussed. Reflection is structured but informal, often facilitated through prompts or questions embedded within the learning tools themselves. Participants are encouraged to articulate not only what they made, but how decisions were taken, where uncertainty arose, and how interactions with others influenced outcomes. This reframing of critique- as inquiry rather than judgement- has proven particularly important in addressing student reluctance to engage in critical discussion. By focusing on process rather than quality, reflection becomes less about defending work and more about understanding it.

Behavioural Adaptation

Reflection then feeds directly into adaptation. Participants are invited to modify their approach, tools, or behaviours in response to what has been discussed. This might involve altering materials, reconfiguring group dynamics, or reframing the initial question that guided the activity. At this stage, the workshop begins to demonstrate its cybernetic nature: outputs from one cycle become inputs for the next. Learning is not cumulative in a linear sense, but recursive, shaped by continual adjustment.

Iterative Continuation

The cycle is repeated, often several times within a single session. With each iteration, participants typically become more comfortable with uncertainty and more attentive to the relational aspects of making.

During initial trials of this structure with BA Visual Communication students, participants initially struggled with the absence of clear outcomes, the lack of instruction - and were predictably cautious. However, by the third cycle, the discussions had shifted noticeably. Participants began to reference earlier decisions, draw connections between material choices and group dynamics, and articulate

learning that extended beyond the immediate task. What changed was not the complexity of the tools, but participants' relationship to the process itself.

Over time, the workshop could function as a living organism, shaped by the contributions and responses of those involved. The role of the facilitator is not to direct learning but to maintain the conditions in which feedback, reflection, and adaptation can occur. This aligns with Ascott's conception of education as a behavioural system and with Bateson's notion of learning as a process of becoming aware of one's own patterns of thought and action. Within this model, visual communication is repositioned as a method of inquiry rather than display, supporting Barbara Bolt's assertion that knowledge is produced through the event of making rather than its documentation alone.¹⁴

While the model is presented here within an arts education context, initially trialled with undergraduate students, its emphasis on participation, reflexivity, and adaptability suggests broader relevance. By foregrounding process and relationality, the cyclical workshop offers an alternative to linear pedagogical structures, supporting learners in developing confidence, critical engagement, and an openness to uncertainty that extends beyond the studio.

CONCLUSION

Revisiting Roy Ascott's cybernetic pedagogy offers a way of responding to contemporary educational challenges without nostalgia. By translating rather than replicating historical models, it becomes possible to foreground collaboration, tactility, and reflexivity within learning environments increasingly constrained by linear assessment structures.

A cyclical, cybernetic making process encourages students to embrace uncertainty, reposition critique as a shared resource, and cultivate awareness of how knowledge is constructed.

It is also, as Barad might remind us, a question of what we take knowledge to be. A pedagogy that takes intra-action seriously cannot afford to treat making as illustrative, as the production of evidence for ideas formed elsewhere. Making must remain a site of inquiry in itself.

Ultimately, it frames arts education not as a pathway toward fixed outcomes, but as a living system capable of continual transformation through care, curiosity, and collective engagement.

NOTES

- ¹ Karen Barad, *Meeting the Universe Halfway* (Durham: Duke University Press, 2007).
- ² Kate Sloan, *Art, Cybernetics and Pedagogy in Post-War Britain* (London: Routledge, 2019).
- ³ Roy Ascott, *The Construction of Change* (London: Ealing College of Art, 1964).
- ⁴ W. Ross Ashby, *An Introduction to Cybernetics* (London: Chapman & Hall, 1956).
- ⁵ Sloan, *Art, Cybernetics and Pedagogy in Post-War Britain*.
- ⁶ Roy Ascott, "Behaviourist Art and the Cybernetic Vision," *Cybernetica* 10, no. 1 (1967).
- ⁷ Interview with Roy and Claudia Ascott, July 2024.
- ⁸ Interview with Roy and Claudia Ascott.
- ⁹ Hazel Smith and Roger T. Dean, *Practice-led Research, Research-led Practice* (Edinburgh: Edinburgh University Press, 2009).
- ¹⁰ Barad, *Meeting the Universe Halfway*.
- ¹¹ Henk Borgdorff, *The Conflict of the Faculties* (Leiden: Leiden University Press, 2012).
- ¹² Gregory Bateson, *Steps to an Ecology of Mind* (Chicago: University of Chicago Press, 1972).
- ¹³ Borgdorff, *The Conflict of the Faculties*.
- ¹⁴ Barbara Bolt, *Art Beyond Representation* (London: I.B. Tauris, 2004).

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VALUE OF THE COPY: HYBRID PEDAGOGY, REPRODUCTION, AND INTERNATIONAL EXCHANGE IN CONTEMPORARY ART EDUCATION

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INTRODUCTION

This article examines *Value of the Copy*, a hybrid pedagogical initiative in fine art education that rethinks international exchange, reproduction, and the contemporary studio. Initiated at Central Saint Martins (University of the Arts London) in collaboration with Beaux-arts, Paris, and realised with the Royal Academy of Art, The Hague, and the Glasgow School of Art, the project emerged in response to restricted international mobility following the COVID-19 pandemic and the United Kingdom's withdrawal from the Erasmus programme.¹ Rather than replicating mobility-based exchange, *Value of the Copy* develops an expanded studio model that operates across institutions, collections, physical sites and digital platforms.²

Through a combination of online studios, locally embedded site-based teaching, and experimental engagement with analogue and digital reproductive technologies - plaster casts, copies, scans, paper squeeze casts, photography - the project positions reproduction as both a pedagogical tool and a critical object. In doing so, it reframes debates around originality and aura, most notably articulated by Walter Benjamin, while reframing these concerns within a pedagogical rather than purely aesthetic register.³ The article argues that *Value of the Copy* offers a scalable and sustainable framework for international art education, aligning teaching, research, and knowledge exchange while foregrounding questions of heritage, decoloniality, and the politics of reproduction.

Value of the Copy ran for two successive academic years between 2022 and 2024. It has produced several splinter projects that run through Central Saint Martins' BA Fine Art course and its Research and Knowledge Exchange departments. The authors wrote an internal report in mid 2025 and the project is currently being considered for scaling up within University of the Arts, London.

ORIGINS AND CONTEXT

Value of the Copy emerged in 2022 at the intersection of immediate institutional pressures and longer-term pedagogical concerns.⁴ While pandemic-related travel restrictions and the loss of Erasmus funding provided the immediate impetus, the project was shaped equally by three ongoing conditions within fine art education.

First, it drew upon a legacy network of Erasmus partners, developed through the BA Fine Art course at Central Saint Martins. This network reflects what Etienne Wenger describes as a "community of

practice,” in which shared activity over time produces common values, methods, and tacit knowledge.⁵ Second, the project responded to increasing uncertainty surrounding the status of plaster cast collections - once central to academic training, but increasingly marginalised as museums and art schools reassess Eurocentric canons and colonial legacies. Third, it acknowledged the continued importance of reprographic processes within contemporary art practice, aligning with Rosalind Krauss’s argument that modern and postmodern art is deeply structured by logics of repetition, indexing, and reproduction.⁶

The Copy in Historical and Contemporary Perspective

Historically, plaster casts functioned as pedagogical surrogates, enabling access to canonical forms without the need for travel. As André Malraux famously proposed in his concept of the *musée imaginaire*, reproduction allows artworks to circulate beyond their original contexts, reshaping art history itself.⁷

Contemporary digital facsimiles perform a comparable function. Advances in three-dimensional scanning, photogrammetry, and digital modelling have renewed debates around authenticity, access, and conservation. By linking historic casting practices with contemporary digital reproduction, *Value of the Copy* positions the copy as an active agent within pedagogy mediating between past and present, material and virtual, local and international.

STRUCTURE AND METHODS

A Hybrid Model of International Exchange

Rather than attempting to replicate traditional exchange programmes, *Value of the Copy* adopted a hybrid structure combining remote international collaboration with locally embedded, site-based teaching.⁸ This model aligns with emerging research on hybrid learning, which emphasises the value of combining synchronous digital interaction with materially grounded, situated learning.

Two interconnected modes of engagement structured the project. Monthly online studio meetings brought together students, academic staff, technicians, and curators from all four institutions. These sessions functioned as shared critique spaces, emphasising dialogue, peer learning, and non-hierarchical discussion. Alongside this, each institution organised in-person workshops, site visits, and teaching activities grounded in their own collections and facilities whilst ideas of the copy and reproduction provided a conceptual framework uniting dispersed and different local contexts.

Activating Historic Study Collections

A defining feature of *Value of the Copy* was its engagement with historic study collections composed of reproductions. Each partner institution worked with a distinct collection shaped by its own institutional history. Rather than treating these collections as obsolete remnants of academic training, the project reframed them as sites of critical inquiry.

This approach aligns with recent scholarship in museum studies that argues for the activation of collections through use, reinterpretation, and artistic intervention.⁹ Scholars such as Elizabeth Edwards have emphasised that reproductions are not secondary objects but have their own material, social, and affective lives.¹⁰ By situating cast collections within contemporary studio practice, *Value of the Copy* challenged distinctions between original and copy, archive and studio, preservation and production.

Pedagogy

The pedagogy of *Value of the Copy* was organised around three central components. Monthly international studio meetings provided continuity and collective reflection; contextual lectures and object-based learning introduced students to historical, theoretical, and ethical frameworks surrounding reproduction; and technical workshops supported skill development in analogue and digital processes, including casting, photogrammetry, and printmaking.

This structure reflects principles of object-based learning, which emphasise close engagement with material artefacts as a catalyst for critical thinking and creative production.¹¹ By combining object-based pedagogy with digital platforms for collaboration, the project extended the studio beyond a single physical location, aligning with expanded studio models increasingly discussed within art education research.¹² The flexible framework enabled adaptation to each school's pedagogical approach, from the atelier system at BA to the modular system at CSM.

Through site-responsive learning, local, site-specific resources functioned simultaneously as research material and expanded studio environments, fostering the synthesis of object-based and spatial practices and enabling a methodological shift from object-focused study to architectural and organisational scales of inquiry. Within this structure, the project framework also operated as a model for collaboration across specialisms, recognising and activating intersections between fine art, curation, museology, technology, social practice, and heritage.

STUDY COLLECTIONS

Victoria and Albert Museum and Beaux Arts, Paris

Across the four partner art schools, the material character and institutional histories of their collections varied significantly, and this diversity is worth expanding upon here. During the first phase of the project, Central Saint Martins worked with the Victoria and Albert Museum's Cast Courts and reprographic collections as its primary point of reference. Alongside plaster casts, these holdings include metal electrotpe reproductions, underscoring the V&A's long-standing engagement with multiple reproductive technologies.

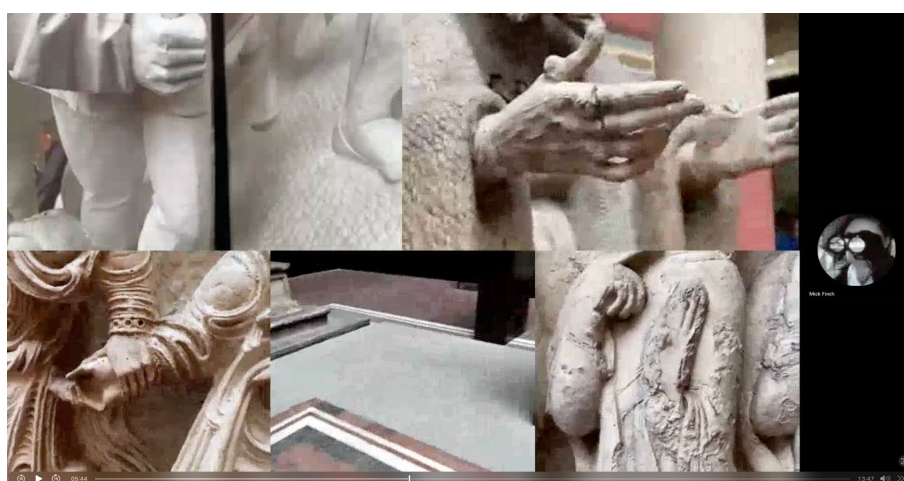


Figure 1. Victoria and Albert Museum livestream/remote workshop. Mosaic of participant's call-windows using Microsoft Teams, 22nd February 2025

Opened in 1873, the Cast Courts provide a crucial historical lens through which to understand why and how copies became central to nineteenth-century museum and pedagogical practice. The Courts served not only a museum public - many of whom lacked the means to undertake the Grand Tour - but also functioned as a study collection for what would later become the Royal College of Art, whose

studios were housed within the same building. Early curatorial strategies reinforced this pedagogical role by displaying photographs of original works in situ alongside their casts, foregrounding both origin and translation.

Although the Cast Courts were designed to house monumental works such as Trajan's Column - famously divided into two sections to be accommodated by the architecture - their curatorial emphasis increasingly included a constructed narrative of a British Renaissance. Following the Great Exhibition of 1851, the transfer of artefacts into the V&A further reinforced this shift. Reproduction thus operated not simply as a tool of access, but as a means through which national cultural identity was inserted into a broader narrative of European civilisation.

A comparable yet distinct logic operates within the plaster cast collection housed in La Chapelle des Petits-Augustins at the Beaux-arts, Paris. Here, casts are shown alongside copies of paintings, with French Renaissance works curated in proximity to those of the Italian canon. The synoptic power of reproduction is evident in the way figures such as Jean Goujon and Michelangelo are positioned as conceptual peers, collapsing geographical and historical distinctions through curatorial adjacency.

Beaux-arts, reconstituted as a republican institution in the aftermath of the French Revolution, and later operating across successive political regimes - including the Restoration, the Second Empire, and subsequent republics - used these collections as instruments for training artists within aesthetic frameworks that aligned with shifting state ideologies. In both Paris and London, cast collections functioned as pedagogical engines through which political authority, imperial ambition, and cultural hierarchy were reproduced and naturalised within national institutions.

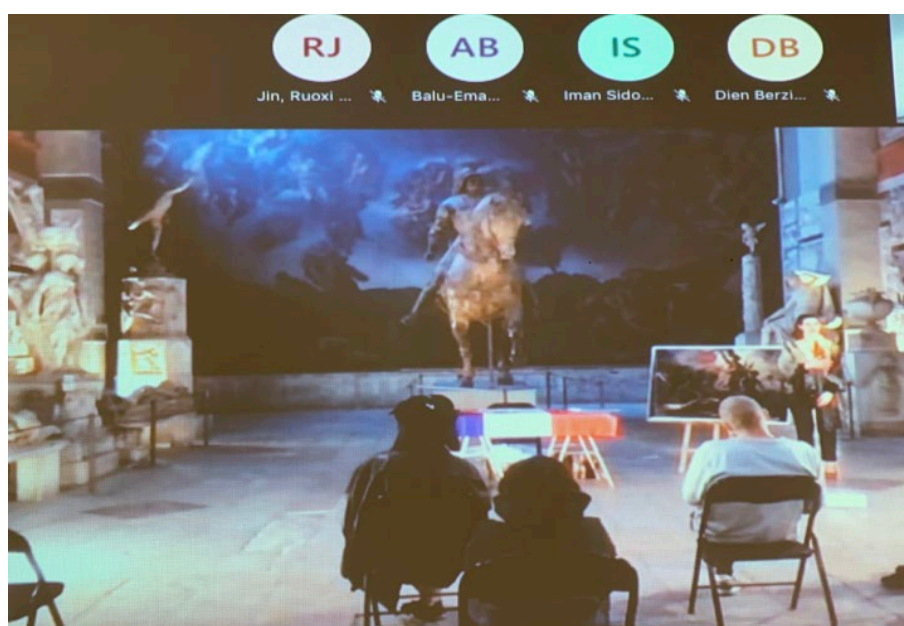


Figure 2. Video-call window from Microsoft Teams facilitated livestream/remote workshop: performance at Beaux-art livestreamed to 'Vestibule' exhibition event at Lethaby Gallery, Central Saint Martins, 19th January 2023

Contemporary processes of decolonisation invite a critical re-engagement with these collections, not as obsolete teaching tools, but as contested sites of historical and ideological production. Within *Value of the Copy*, the Victoria and Albert Museum's Cast Courts and La Chapelle des Petits-Augustins emerged as complex pedagogical terrains, offering insight not only into how imperial cultural representation was historically constructed, but also into how these artefacts continue to operate - and be reinterpreted - within the present.

Central Lettering Record at Central Saint Martins



Figure 3. Reflectance Transformation Image of paper squeeze cast from the Central Lettering Record, Central Saint Martins

In the second year of the project (academic year 2023-24), Central Saint Martins shifted its engagement from the Victoria and Albert Museum's Cast Courts to the Central Lettering Record. Established in 1963 by Nicholas Biddulph, the collection comprises over 13,000 artefacts - primarily photographs - documenting diverse lettering styles organised by function and is now housed within the Central Saint Martins Museum and Study Collection. It also includes paper squeeze casts of ancient Roman stone inscriptions made by Nicolette Gray in the 1970s. These lightweight casts were intended to challenge the dominance of Trajan Roman as the perceived epigraphic ideal of antiquity, and to broaden typographic histories through processes of collecting, categorising, and reclassification. Produced by pressing damp paper into carved stone inscriptions and allowing it to dry, squeeze casting offered students both a rapidly adaptable reprographic technique and a model of historical research grounded in material translation and critical reinterpretation.

Glasgow School of Art and The Royal Academy of Art, The Hague

Glasgow School of Art's collections offered a markedly different perspective from the more normative conditions found in London and Paris. The School's iconic nineteenth-century Mackintosh Building was severely affected by two fires, events that fundamentally reshaped both its physical fabric and its study collections. The first fire caused significant but localised damage, prompting the building to be comprehensively documented using photogrammetry. During this period, the cast collection was dispersed: intact works were relocated to temporary teaching spaces, while damaged casts were moved into reserve.

The condition of the casts following the first fire varied considerably, ranging from undamaged to smoke-affected or partially fire-damaged. While restoration and conservation work on the Mackintosh Building was underway, a second fire occurred, devastating the structure and leaving only the external walls intact. As a result, the photogrammetric scan produced between the two fires has assumed an unforeseen significance.

Within *Value of the Copy*, this digital record functioned as a contemporary addition to the School's study collection, providing students with access to a version of the building and its collections that no

longer physically exists. The catastrophe thus transformed the status of the reprographic: the scan does not merely document loss but operates as a pedagogical artefact. As such, it constitutes an extraordinary resource whose potential for future teaching, research, and artistic practice warrants sustained exploration.



Figure 4. Basement of The Royal Academy of Art, The Hague in 2024 with remains of casts vandalised in student protest of 1968

The Royal Academy of Art, The Hague, offers a further variation on the relationship between reproduction, institutional ideology, and catastrophe. Its Functionalist building, opened in 1938, was designed with dedicated spaces for a plaster cast collection. At the time, the Academy's director opposed the inclusion of this nineteenth-century pedagogical apparatus within an institution that sought to align itself with modernist cultural values. Although his objections were overruled, the collection remained marginalised, perceived as a residue of an earlier academic model.

The subsequent occupation of the Netherlands by Nazi forces in May 1940 marked a sharp ideological reversal. Modernist values were displaced in favour of classical Greco-Roman aesthetics, and the Academy's cast collection - unlike those in London or Paris - contained substantial classical holdings that aligned closely with the cultural ideology of the occupying regime. During this period, reproduction was reactivated as a tool of ideological formation, demonstrating how the pedagogical status of casts could be rapidly reconfigured in response to political power.

A further rupture occurred in 1968, when a significant portion of the cast collection was destroyed during a protest organised by the Provos, a Dutch anarchist activist group. For decades, the event persisted within the Academy as rumour: fragments were said to have been buried somewhere within the building, possibly beneath a courtyard. This narrative resurfaced prior to *Value of the Copy*, when discussions between Mick Finch of Central Saint Martins and staff and students of Beaux-arts prompted renewed interest in the collection's fate.

The story gained material confirmation when an Erasmus student on exchange from Beaux-arts, Robin Whitehouse, located a substantial cache of cast fragments buried beneath an earth-floored basement at the Academy. Following formal permission to excavate the site, these fragments became both the material basis of Whitehouse's degree exhibition and a focal point of collaboration across the four institutions participating in *Value of the Copy*. The rediscovery transformed what had been an

institutional myth into a tangible pedagogical resource, foregrounding destruction, recovery, and reproduction as central themes within the project.

Across the case studies, a recurring pattern emerges in which study collections move cyclically between phases of pedagogical utility, marginalisation, neglect, and, in some instances, destruction. Their reappearance within the present - as reactivated or recontextualised resources - reveals a significant but often overlooked pedagogical potential. *Value of the Copy* demonstrates how such reactivations enable historic collections to be read not as static remnants, but as participants within an unfolding temporal continuum.

The project also traces shifts across successive phases of reprographic technology, foregrounding how digital methods intersect with and extend analogue holdings. Through processes such as scanning, photogrammetry, and digital modelling, artefacts are not simply preserved but re-membered - reassembled and reactivated - within new pedagogical and conceptual frameworks. In this sense, reproduction operates as a temporal bridge, linking past educational practices with contemporary modes of learning and collaboration.

OUTCOMES

Peer Learning and Cross-Cultural Exchange

One of the project's most significant outcomes was the formation of international peer networks. Pairing students across institutions fostered collaborative relationships and frequently produced hybrid works combining different cultural and pedagogical approaches. Such peer-to-peer learning aligns with constructivist models of education, which emphasise knowledge production through social interaction rather than didactic instruction.

Students gained insight into differing pedagogical traditions: the atelier model in Paris, study-group structures in The Hague, workshop-based extracurricular cultures in Glasgow, and digitally oriented object-based learning in London. This comparative awareness reinforced the project's emphasis on pedagogy as culturally situated rather than universal.

Sustainability and Future Models of Exchange

Whilst this teaching model was developed as an Erasmus alternative it offers distinct differences and advantages over Erasmus and, upon the UK's re-entry into Erasmus, the model should be considered as developing a complimentary form of remote institutional and cohort to cohort engagement that exceeds the individual student exchange of the Erasmus programme. By reducing reliance on physical travel while maintaining meaningful international collaboration, *Value of the Copy* offers a sustainable alternative to traditional exchange programmes. Its cohort-to-cohort model shifts emphasis from individual mobility to collective exchange, aligning with calls for more ecologically responsible approaches to international education. *Value of the Copy* provides an in-house alternative to conventional internships, extends student's continuing professional development and mitigates financial, geographic, visa and disability-related barriers to participation.

KNOWLEDGE EXCHANGE, RESEARCH, AND TEACHING

Value of the Copy exemplifies an integrated approach to teaching, research, and knowledge exchange. Knowledge exchange, understood as a two-way flow between universities, cultural institutions, and wider publics, is increasingly recognised as a core function of higher education.¹³ Through exhibitions, public programmes, and collaborations with curators and technicians, the project embedded this principle within its pedagogical design.

All partners used the project to integrate public-facing and research-oriented work. The project offers increased potential for community engagement: Beaux-art's use of La Chapelle for public

presentations; The Royal Academy of Art, The Hague's integration of *Value of the Copy*'s thematics within a study group and Central Saint Martin's use of the Lethaby Gallery to host an active place of experimentation, collaboration and inter-connectivity. These approaches united remote partners and local publics offering models for embedding this work beyond the immediate institutions.

Toward the end of the project's second phase, Central Saint Martins initiated contact with the Accademia di Brera in Milan. Professor Nicoletta Leonardi, whose research focuses on the history of photography, has been working extensively with Brera's photographic study collections. Of relevance is a portfolio of photographs historically used by architectural students as drawing references, a practice that closely parallels the use of photographic sources at the École des Beaux-Arts in Paris.

These photographic portfolios also played a significant ideological role during the Risorgimento, functioning as synoptic tools through which typologies of landscape and architecture were mobilised to construct narratives of national identity. As such, they extend the project's broader inquiry into how reprographic media have historically served both pedagogical and political ends.

Although *Value of the Copy* did not engage in direct pedagogical collaboration with Brera, the project contributed to a subsequent funding bid: *Taxonomies of Catastrophe*, led by Central Saint Martins, through which several of *Value of the Copy*'s core concerns were further developed. These ideas have since been integrated into an initiative led by Leonardi entitled *L'ArtNet*, which focuses on the future value of study collections embedded within cultural institutions. The initiative foregrounds the continued pedagogical relevance of such collections and will culminate in a conference at the Accademia di Brera in May, extending the project's network and research trajectory beyond its original framework.

CONCLUSION

Value of the Copy demonstrates how reproduction can serve as a powerful pedagogical framework for contemporary art education. By activating historic collections, integrating digital technologies, and fostering hybrid international exchange, the project reimagines the role of the studio, the museum, and the copy itself. Rather than positioning the copy as secondary to originality, the project reveals reproduction as a site of critical inquiry, cultural negotiation, and pedagogical innovation.

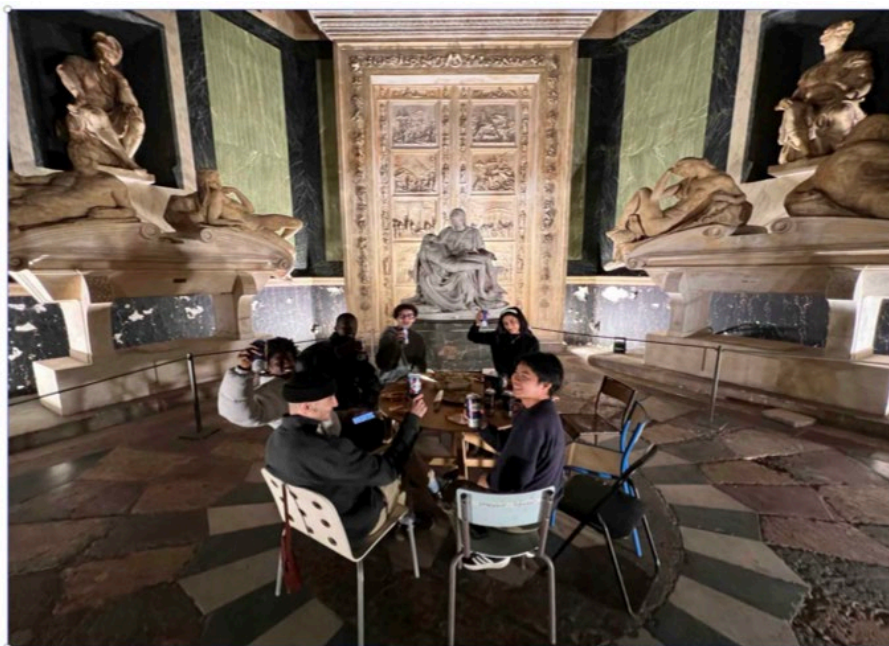


Figure 5. Students participating in an activation event at Beaux-arts, Paris, 2022

NOTES

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3. Walter Benjamin, "The Work of Art in the Age of Its Technological Reproducibility," in *Selected Writings*, vol. 3, ed. Howard Eiland and Michael W. Jennings (Cambridge, MA: Harvard University Press, 2002).
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TRANS-TEMPORAL AND TRANS-GEOGRAPHICAL ASSESSMENTS IN TEACHING THE HISTORY OF JAPAN SINCE 1600 CE

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INTRODUCTION

AI has suddenly become an essential tool in undergraduate education. 92% of recent undergraduates (surveyed in April 2025) had used AI in their coursework in some way, compared with 66% in 2024.¹ This has increased the urgency for university educators to adapt their curricula and assessments to keep up with the changes brought on by AI, a process which is ongoing by instructors at universities around the world.² Although the accuracy of AI information retrieval is sometimes questionable, there are little to no significant institutional or governmental reforms that are in place to slow the pace of AI's proliferation and increasing use among the general public, despite some calls from experts and prominent politicians for more regulation of AI.³ This means that university educators must develop methods for effectively integrating the use of AI in their teaching, rather than one which excludes (or bans) the use of AI in the classroom entirely, a notion which seems shortsighted and likely to hamper students' abilities to carry out effective research in their post-university professional and personal lives.⁴

Therefore, university educators must learn to adapt their class environments in a way which does not overrely on the use of AI, but also does not ignore it. AI has the potential to be harnessed for "good" use potentially, but we also must recognize its many existing shortcomings, while also envisioning ways in which we can use this technology to bring historical experience to a more relevant place. The urgency of the situation makes it imperative to devise creative and insightful ways of utilizing AI in the university history classroom that may inspire undergraduates to make a better future for the world which they will live in, in which AI has become inseparable from day-to-day existence.

HISTORY EDUCATION TO DEVELOP HISTORICAL CONSCIOUSNESS

For the teaching of history courses, it is always essential to make learning authentic and timely, or risk relegating the past only to the past. As the American humorist, writer, and public intellectual Mark Twain is attributed to have once said, "History does not repeat itself, but it often rhymes."⁵ Twain in this message was not proclaiming that history repeats itself, but that instead we need to be aware of times when similar patterns emerge in order to be able to navigate successfully through the present. Past examples of "rhyming" events or occurrences can provide us with important guideposts that should not be ignored. By recognizing "rhyming" events in history, students may also be able to

develop more of an historical consciousness, and a greater awareness of historical periodization which may be the most important goal of historical education.⁶

The history of Japan since 1600 CE, or a modern history of Japan, is a commonly offered topic for a course at universities around the world. Most instructors of these courses focus, among other topics, on how Japan shifted from a traditional or “feudal” society to become a modern state with a fully developed economy in a relatively short period of time. While the topic is inherently interesting for those with an interest in history or an interest in Japan itself, it is, like any topic, easy to lapse into teaching this history as “one damn thing after another.”⁷ This paper explores one method of challenging students to think across time periods by using AI tools to search for historical source examples from the history of Japan that can make transtemporal comparisons.

AI, or LLM's, are uniquely capable of searching large volumes of data and historical texts in a short period of time to cull together information from disparate textual sources.⁸ This is perhaps the chief advantage of AI for historians, who have traditionally built the discipline of history in the modern era through the literal combing of archives and libraries. AI is quickly becoming a superior method for extracting information efficiently from written historical sources, like heritage books.⁹ Although the current state of AI technology is far from perfect, it has the potential to extract information in an increasingly sophisticated way. AI tools are especially useful at being able to categorize textual examples by scanning and analyzing scores and scores of databases and locate texts which are readily available or easy to access in digital format, while also largely eliminating from its search results text examples which are irrelevant or not pertinent. In response to these rapid changes, some university libraries and history departments have lately begun integrating AI into their historical research training for aspiring historians.¹⁰ Large and influential historical organizations have also begun formulating strategies and policies on how to address the use of AI in historical research and teaching.¹¹

TRANS-TEMPORAL AND TRANS-GEOGRAPHICAL ANALYSIS

For any sort of university history course, one of the main learning outcomes should be to cultivate a greater historical awareness across time periods, centuries, or decades.¹² Many students struggle to grasp a strong sense of chronology, periodization, or how to make sense of broader categories of historical periods.¹³ In the case of Japan's history, this is also very challenging. In a course on the modern history of Japan stretching from the early 1600s to the recent past, the change is somewhat mindboggling. Japan went during these 4 centuries from a feudalistic society, to an industrialized one, to an imperialistic power, to a defeated nation, to a society that rebuilt and prospered, to a society today which is troubled by the many issues of late stage capitalism.¹⁴

It is crucial for students to be able to discern about the changes in different periods and to be able to differentiate what makes each different period unique. This kind of sensibility is essential in developing critical thinking and for better awareness of historical phenomena. It also can be a useful toolkit for discerning patterns (rhymes) about things transpiring in the present. Current global concerns about moves towards authoritarianism and away from democracy, rise of social and economic inequality, degradation of mainstream media and the rise of social media as a primary information source for many of the world's peoples are all legitimate problems which it benefits our students to be aware of. When news reports highlight these issues, it is argued here that students can benefit from identifying common patterns between current events and the past, even when those events are happening outside of Japan. For example, students may notice parallels between the political turmoil of Japan's Taishō era (1912-26) and the challenges faced by democratic societies in the contemporary world.¹⁵ This can help students to draw connections between the ways in which Japan's peoples dealt with difficult and rhyming occurrences in the past. This type of activity can

contribute to greater awareness of historical time periods, while also making historical knowledge more relevant for addressing contemporary social and cultural issues.

USING AI IN TRANS-TEMPORAL ASSESSMENTS

In courses which focus on the history of Japan since about 1600 CE to the present or recent past, many educators likely avoid drawing trans-temporal comparisons and instead prefer to focus only on the events and of the time itself under study. This is in part because many historians do not feel comfortable trying to draw comparisons to current or more recent events. In fact, many probably avoid discussions of the present or of contemporary history until those topics arrive in the teaching of the syllabus, most often at the end of a semester or term. But this is overlooking the importance of making history relevant for today's students, and also risks relegating history to an outdated study of the past alone. Inviting undergraduate students to draw comparisons and make assertions about the recent past or even the present can make for more engaging discussions and classes. This may even lead students to think deeply about the root problems that happened in different time periods within that history.¹⁶ An assessment description follows which can be useful for bridging the historical divide between the distant past and the more recent past.

MAKING JAPAN'S HISTORY RHYME ACTIVITY

Step 1) Students should choose an event, concept, or important change from the Tokugawa Shogunate era (1600-1868 CE) to focus their attention on for the first part of this activity.

Step 2) They should then have their AI chatbot search for sources which are representative of different viewpoints about that event from historical primary sources. If no sources are available in English translation, they can find them in Japanese or in other languages and translate them into English using AI or machine translation tools. The AI chatbot should then retrieve a selection of sources which are representative of that topic.

Step 3) Students should then ask their AI chatbot to find examples of events, concepts, or important changes from the later or recent history of Japan (after the 1868 the Meiji Restoration, up until the early 21st century) which "rhyme" historically in some fashion with their chosen event. In other words, these more recent events, concepts or changes should have some element of comparability with the earlier chosen topic.

Step 4) Have their AI chatbot then search for a selection of representative historical sources (available in English translation) which describe that later or more recent topic.

Step 5) Then students should then work to analyze the sources and draw comparisons and contrasts between the two topics (1 topic from Tokugawa era Japan and 1 topic from the late 19th to early 21st century Japan).

Step 6) In the final step, students should make a brief presentation of 5-7 minutes in which they analyze the degree to which the 2 chosen topics from 2 different time periods "rhyme" or do not "rhyme." Questions which they may want to explore include: How are the two events/periods different? What accounts for the differences? What evidence of similarities exist between the 2 events/time periods from the sources? Are there historical lessons to be learned from these two topics?

Activity Implementation

In testing this proposed activity, the author found that ChatGPT was quite effective at retrieving relevant historical sources. In one such test run of the activity (see Step 1 and Step 2 of the proposed activity above), the author had ChatGPT retrieve sources on the topic of the era of Japan's so-called "closed country" policy, called *sakoku*.¹⁷ This era began during the 1630s with policies implemented by the Shogun Tokugawa Iemitsu and lasted until the 1850s and the arrival of Commodore Matthew

Perry, which eventually led to the signing of the Harris Treaty of 1858 and the end of the policy of foreign exclusion.¹⁸



Figure 1. "Tokugawa Iemitsu," Wikimedia Commons, Accessed December 30, 2025, <https://commons.wikimedia.org/wiki/File:Iemitsu.jpg>

The query called for the LLM to retrieve "primary sources which can be retrieved to describe the decision to begin the *sakoku* "closed door" policy in Japan (in English, or in English translation)?"¹⁹ The list of sources which were retrieved was extensive and of high quality, including sources from the points of view of Tokugawa administrators as well as European outsiders. The AI chatbot also recommended Engelbert Kaempfer's *History of Japan*, which provides the perspective of a German scientist who lived in Nagasaki from 1690-92 and carried out a great deal of academic research.²⁰

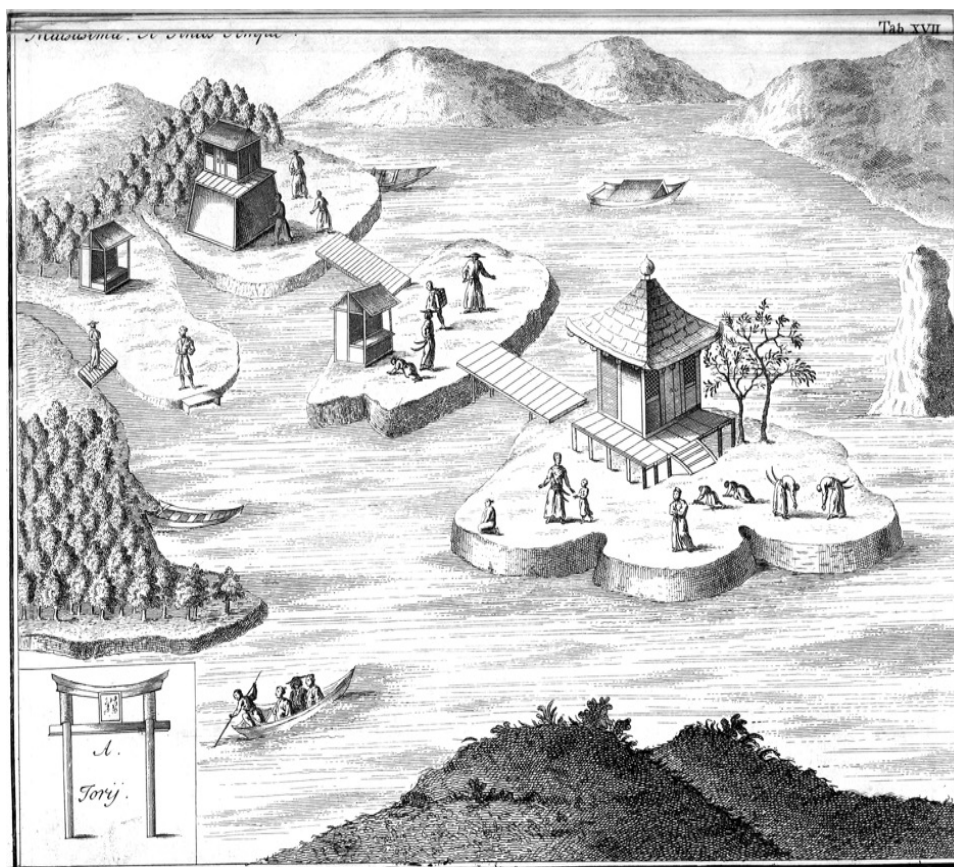


Figure 2 From Engelbert Kaempfer, *History of Japan 1727*, Wikimedia Commons, Accessed December 30, 2025, [https://commons.wikimedia.org/wiki/File:Kaempfer_History_of_Japan_1727_vol_1_\(IA_historyofjapan_gi01kaem\)_Tab_17.jpg](https://commons.wikimedia.org/wiki/File:Kaempfer_History_of_Japan_1727_vol_1_(IA_historyofjapan_gi01kaem)_Tab_17.jpg)

Some of the sources were readily accessible online while others would require access to the physical source in non-virtual libraries.²¹ This list of sources would provide much food for thought for undergraduate students, who could then access these sources online during a class session or (for those more advanced classes, or at classes with an adequate research library) make a library visit to access other sources that may not be readily available in online format. This part of the activity can also be adjusted in terms of the length of needed sources. More generalized courses can request brief excerpts, while more advanced ones may want to investigate longer pieces of historical materials to allow for a more in-depth analysis.

In Step 3, the author asked ChatGPT which "historical events later or in recent history (after at least 1868 to the 21st century) 'rhyme' with the creation of the *sakoku* policy in Japan?" The list of periods which were in the response included the internationalization of the late-nineteenth century Meiji era, the 1930s withdrawal from the League of Nations following the attack on Manchuria amidst the rise of militarism and nationalism, and most recently the border restrictions of the early 2020s Covid era.²² Each period of seclusion does reflect moves away from a more globalized policy, though some clearly more than others. The list of events and time periods which are retrieved in this activity also lend themselves to potentially interesting historical discussions. For example, instructors may want to ask their students which of the periods in this list seems the most important for us to learn from for the future and why? How can we differentiate between these different periods?

In this proposed activity, students would then need to choose one of the periods to compare with the *sakoku* era (Step 4). In this test run, the author chose the 1930s rise of militant nationalism. Japan retreated from international diplomacy following the 1931 invasion of Manchuria and the subsequent findings of the League of Nations' Lytton Commission report. Following the League of Nations' condemnation of Japan's aggressive actions in Manchuria, tensions with China and Western powers like Great Britain and the United States became worse, which led to further militarism in Japan.²³



Figure 3 "Lytton Commission at Railway," Wikimedia Commons, Accessed December 30, 2025, https://commons.wikimedia.org/wiki/File:Lytton_Commission_at_railway.jpg

ChatGPT was then prompted to retrieve a selection of sources relevant to that topic for students' examination. The list which was returned in the test included ten different suggestions for sources, which were sub-categorized into official governmental sources, publications from Japan's education system and speeches from public figures, and some foreign observations of the time including from diplomats. A significant number of excerpts from these sources are available in a text often assigned in courses on the history of Modern Japan, De Bary's *Sources of Japanese Tradition*.²⁴

The list of sources which the chatbot returned was again quite thorough. Some of the listed sources, like the Imperial Rescript on Education, are outside the timeframe of the query, but it correctly asserts that this source was still very influential and important during the 1930s, as it was a required recitation for schoolchildren in Japan.²⁵ The list again provides sources which are either easily available online, or could be located in many university libraries in printed sources or online university catalogs. One of the most useful elements of this technology for educators is the last line of this response, in which the chatbot asks if the user would like to have a ready-made compact list of excerpts from these sources.

The final stages (Step 5 and Step 6) of this activity involves having students read from the examples in the sources which were found and begin to draw some conclusions on how these 2 periods, the creation of the *sakoku* policy, and the 1930s withdrawal from world affairs, compare with each other. At this point in the proposed assesment activity, students should redirect their attention away from the AI and engage in some traditional source analysis and comparisons. Educators may, at this point, want to encourage students to go beyond the lists which their chatbots generated if they wish. This could result in a student presentation on their findings, though this could also be other types of assessments, like an analytical paper on their analysis, a podcast, or a documentary style video.

CONCLUSION

The use of generative AI for this historical activity gives students the opportunity to relatively easily collate together sources of their own choosing from a wide range of perspectives. Rather than having the instructor choose sources for students to analyze, it puts more power in the hands of students to navigate through using their own choices. The ease with which sources can be retrieved using AI tools makes doing such an activity during a class session relatively easy to accomplish as well.

By using an AI chatbot and following the step-by-step instructions in the assessment description, students may be less likely to run into stopping points as they might in a traditional webquest version of this assignment. A research library version of the same assignment would not be even possible without taking up many hours of time to locate sources. Some may criticize this by pointing out the inherent value in spending time in the library to locate sources. But this is, for better or worse, becoming a less and less common way for historians and university undergraduates to conduct their research. AI has made much research much more compressed than ever before. If we do not adapt to the speed of this, we risk running behind and leaving our students ill-prepared for the pace of research today and in the years to come.

This activity could be implemented in most modern history courses. If implemented well, it accomplishes a few important learning outcomes for history education. Students will simulate in some way the process which historians undergo in their own research, by searching for relevant sources and then narrowing down the ones which are more relevant for their use. If instructors are active in monitoring the activity, it can provide an opportunity for students to enhance their critical apparatus for engaging with AI tools. Students will also gain a better understanding of historical change and periodization, while also enhancing their critical thinking skills. Lastly, this activity puts students, with the instructor's support, in a commanding position in how to steer their research. It may also help them to better see through the "rhymes" of history, and make sense of patterns, with the understanding that history never repeats itself, but some themes reemerge in new forms. It may sound cliché, but by fostering this awareness students can learn how today's human societies can steer clear of mistakes of the past.

NOTES

¹ DJS Research, April 2025, accessed October 10, 2025,

<https://www.djsresearch.co.uk/EducationMarketResearchInsightsAndFindings/article/92percent-of-undergraduates-now-use-generative-AI-tools-in-some-form-to-support-their-academic-studies-05678>

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² "AI in Higher Education: How AI Is Reshaping Higher Education," April 18, 2025, <https://www.usa.edu/blog/ai-in-higher-education-how-ai-is-reshaping-higher-education/>, accessed October 30, 2025.

³ It has been argued that the influence of Big Tech companies (Apple, Meta, Google, and Amazon) has played an outsized role in the progress of AI technologies, and the lack of regulation. See, for example, Lisanne Hummel, "The Long-Term Usefulness of Regulating AI in the EU," in *Governing the Digital Society: Platforms, Artificial Intelligence, and Public Values*, Eds. José van Dijck, Karin van Es, Anne Helmond, Fernando van der Vlist (Amsterdam: Amsterdam University Press, 2025), 149-163, <https://www.jstor.org/stable/jj.28874939.14>. United States Senator Bernie Sanders has recently called for greater regulation of AI, particularly for use by children and the environmental impacts caused by building new AI data centers. Edward Helmore, "Bernie Sanders criticizes AI as 'the most consequential technology in humanity,'" *The Guardian*, December 28, 2025, accessed December 30, 2025, <https://www.theguardian.com/us-news/2025/dec/28/bernie-sanders-artificial-intelligence-ai-datacenters>.

⁴ Elizabeth M. Ross, "Embracing Artificial Intelligence in the Classroom: Generative AI tools can reflect our failure of imagination and that is when the real learning starts," Harvard Graduate School of Education, Useful Knowledge, July 20, 2023, accessed December 10, 2025, <https://www.gse.harvard.edu/ideas/usable-knowledge/23/07/embracing-artificial-intelligence-classroom>.

⁵ Admittedly, the author first heard of this quote from Twain through the words of the great historical documentary filmmaker, Ken Burns, who often mentions the Twain quote in public appearances. For a recent example, see "Ken Burns," Where Everybody Knows Your Name Podcast, November 5, 2025, accessed December 10, 2025, <https://teamcoco.com/podcasts/where-everybody-knows-your-name/episodes/ken-burns>.

⁶ Peter Seixas, "Historical consciousness," *Narration, identity, and historical consciousness* 3 (2005): 141. One of the most cogent essays on a case for a global historical periodization was made by Jerry Bentley. See Jerry H. Bentley, "Cross-Cultural Interaction and Periodization in World History," *The American Historical Review* 101, no. 3 (1996): 749–70, <https://doi.org/10.2307/2169422>.

⁷ This view of history as just "one damned thing after another" was criticized by the eminent world historian Arnold Toynbee on multiple occasions. Alden Whitman, "Arnold Toynbee, Who Charted Civilizations' Rise and Fall, Dies," *The New York Times*, October 23, 1975, accessed December 26, 2025, <https://www.nytimes.com/1975/10/23/archives/arnold-toynbee-who-charted-civilizations-rise-and-fall-dies-arnold.html>.

⁸ Nianda Yao, "Integrating AI in historical research: a new method to analyzing national narratives," *Digital Scholarship in the Humanities*, 40, 3 (September 2025): 1033–1040, <https://doi.org/10.1093/lc/fqaf075>; Moira Donovan, "How AI is helping historians better understand our past," *MIT Technology Review* April 11, 2023, accessed December 18, 2025, <https://www.technologyreview.com/2023/04/11/1071104/ai-helping-historians-analyze-past/>.

⁹ Robert Stelter and Rafael Biehler, "Data Retrieval from Local Heritage Books—Is Artificial Intelligence the Solution?" *Historical Methods: A Journal of Quantitative and Interdisciplinary History* (June 2025): 1–19, doi:10.1080/01615440.2025.2512744.

¹⁰ "History: AI for Research," University of South Wales/ Prifysgol De Cymru, accessed December 18, 2025, <https://libguides.southwales.ac.uk/c.php?g=656670&p=5281490>; "History in the Age of AI. One Cambridge historian is harnessing AI to scrutinise over three decades of presidential language—with extraordinary results," University of Cambridge Faculty of History, August 28, 2025, accessed December 26, 2025, <https://www.hist.cam.ac.uk/news/history-age-ai>.

¹¹ "Guiding Principles for Artificial Intelligence in Historical Education," American Historical Association, July 29, 2025, accessed December 26, 2025, <https://www.historians.org/wp-content/uploads/2025/08/AHA-Artificial-Intelligence-in-History-Education.pdf>; David Clayton, Henrice Altink, and Esther Wilson, "Piloting Responsible and Effective Use of Generative AI In Undergraduate History Teaching," Royal Historical Society, July 16, 2025, accessed December 26, 2025, <https://blog.royalhistsoc.org/2025/07/16/piloting-responsible-and-effective-use-of-generative-ai-in-undergraduate-history-teaching/>.

¹² For examples, see Peter N. Stearns, "Thinking Historically in the Classroom: Peter Stearns," *Perspectives on History*, The American Historical Association, October 1, 1995, accessed November 15, 2025,

<https://www.historians.org/perspectives-article/thinking-historically-in-the-classroom-peter-stearns/> ; "Chronological Thinking," *National Historical Thinking Standards*, National Center for History in the Schools (NCHS), University of California, Los Angeles, 1996, accessed December 10, 2025, <https://phi.history.ucla.edu/nchs/historical-thinking-standards/1-chronological-thinking/> . For one example in which an undergraduate department of History emphasizes chronological thinking as the first essential learning outcome for its students, see "Undergraduate History Program Student Learning Outcomes," Oregon State University, College of Liberal Arts, History, accessed November 16, 2025, <https://liberalarts.oregonstate.edu/history/learning-outcomes> ; Dave Neumann, "In Defense of Memorization: The Role of Periodization in Historical Inquiry," *Social Education* 75, 4 (2010): 210-214, 231, accessed December 26, 2025, https://www.socialstudies.org/system/files/publications/articles/se_7504210.pdf .

¹³ Sharon Cohen, "The Challenging Concept of Change Over Time," *World History Connected*, June 2009, accessed December 26, 2025, <https://worldhistoryconnected.press.uiuinois.edu/6.2/cohen.html> .

¹⁴ For historical works which provide useful broad overviews of this period, recommended texts include: Andrew Gordon, *A Modern History of Japan: From Tokugawa Times to the Present*, 3rd ed. (New York: Oxford University Press, 2014); Marius B. Jansen, *The Making of Modern Japan* (Cambridge, MA: Harvard University Press, 2000); Mikiso Hane and Louis G. Perez, *Modern Japan: A Historical Survey*, 5th ed. (Boulder, CO: Westview Press, 2012); Brett L. Walker, *A Concise History of Japan* (Cambridge: Cambridge University Press, 2015); Nancy K. Stalker, *Japan: History and Culture from Classical to Cool* (Oakland: University of California Press, 2018).

¹⁵ For examples of the many issues democratic societies face today, see Yana Gorokhovskaia and Cathryn Grothe, "Freedom in the World 2025: The Uphill Battle to Safeguard Rights," Freedom House, accessed December 10, 2025, <https://freedomhouse.org/report/freedom-world/2025/uphill-battle-to-safeguard-rights> .

¹⁶ Jeffrey Haydu, "Making Use of the Past: Time Periods as Cases to Compare and as Sequences of Problem Solving," *American Journal of Sociology* 104, no. 2 (1998): 339–71, <https://doi.org/10.1086/210041> .

¹⁷ This policy was mostly one of diplomatic and political organization. It began to be implemented in the 1630s and lasted until the 1850s. The Tokugawa limited foreign relations with most of the world, except for Holland, China, Korea, and the Ryukyu Islands. The primary targets of this period of exclusion were Iberia and western Europe. Ronald P. Toby, *State and Diplomacy in Early Modern Japan: Asia in the Development of the Tokugawa Bakufu* (Stanford: Stanford University Press, 1984), 3–6.

¹⁸ "The Polity of the Tokugawa Era," Japan Society, November 6, 2023, accessed December 30, 2025, <https://japansociety.org/news/the-polity-of-the-tokugawa-era/> . On Perry's arrival in 1853, his return in 1854, and the importance of the Harris Treaty see James L. McClain, *Japan: A Modern History* (New York and London: W.W. Norton & Company, 2002), 134-142.

¹⁹ Open AI (2025, GPT-5 free version), <https://chatgpt.com/c/68fd9b54-9ed4-8322-b53f-1d42cdb34573> .

²⁰ Kaempfer's book (in English translation) is readily available online. Engelbert Kaempfer, *The History of Japan* (Glasgow: James MacLehose and Sons, 1906), accessed December 24, 2025, https://ia601403.us.archive.org/18/items/b29353452_0001/b29353452_0001.pdf .

²¹ The list of sources included shogunal edicts of the 1630s restricting foreigner's travel and the practice of Christianity in Japan, correspondences from the Tokugawa to foreign leaders including the King of Portugal and the Dutch East India Company (VOC), Engelbert Kaempfer's account of his time spent in Dejima during the 1690s, and some official governmental reports. The list also included suggestions for books which contain English translations of many of these sources, including Wm. Theodore De Bary, Donald Keene, George Tanabe, and Paul Varley, *Sources of Japanese Tradition, Volume 1*, (New York: Columbia University Press, 2010). Kaempfer's book (in English translation) is readily available online. Engelbert Kaempfer, *The History of Japan* (Glasgow: James MacLehose and Sons, 1906), accessed December 24, 2025, https://ia601403.us.archive.org/18/items/b29353452_0001/b29353452_0001.pdf .

²² The list also included Cold War era economic protectionism during the 1950s until the 1980s under the direction of MITI, post-Fukushima skepticism (post 2011) toward globalization, and, in a extra-Japanese example, the United States' isolationism between the world wars.

²³ Gordon, *A Modern History of Japan*, 189.

²⁴ Wm. Theodore De Bary, *Sources of Japanese Tradition, Volume II* (New York and London: Columbia University Press, 1958), accessed December 24, 2025, <https://archive.org/details/sourcesofjapanes0002tsun/page/n5/mode/2up> .

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CURATING INTANGIBLE HERITAGE: PEDAGOGICAL APPROACHES TO DESIGNING THE SMART MUSEUM AS COGNITIVE INFRASTRUCTURE

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INTRODUCTION

The "post-digital" condition, characterized by the deep permeation and normalization of digital technologies, has fundamentally reconfigured the production, dissemination, and reception of memory, identity, and culture.¹ Within this context, museums, as core societal institutions, face pressing demands for systemic reflection and redefinition. The International Council of Museums (ICOM) 2022 Prague definition formally incorporates intangible cultural heritage (ICH) into the museum's core mandate, emphasizing its role in providing "varied experiences for education, enjoyment, reflection and knowledge sharing" with community participation. This shift marks a pivotal transition from a modern, object-centered paradigm to a postmodern, experience-centered one, prioritizing human process over static artifact.

Concurrently, conceptualizing the museum as cultural infrastructure—a foundational network supporting cultural production, dissemination, and preservation—has gained scholarly traction.² While useful, this paper proposes a necessary theoretical deepening from cultural to cognitive infrastructure. A cognitive infrastructure refers to those designed socio-technical-spatial systems that actively shape cognitive frameworks, influence habits of mind, and enable collective learning. Viewing the museum through this lens transforms its architecture, curation, and digital interventions from neutral backdrops into deliberate cognitive interventions. This perspective aligns with embodied cognitive science, architectural phenomenology, and media ecology, positing cognition as an embodied, situated, and distributed process, rooted in bodily interaction with spatially and digitally mediated environments. To enable museums to truly fulfill the mission conferred by their new definition in the post-digital era—particularly in achieving effective "interpretation" and "experience provision" of intangible cultural heritage (ICH)³—it is necessary to further advance the theoretical deepening and practical exploration of transitioning from a "cultural infrastructure" to a "cognitive infrastructure."

This pedagogical imperative is further amplified by the inherent characteristics of the post-digital era itself, which is defined less by the novelty of digital tools than by their ubiquity and the resultant hybridization of experience. The challenge for educators is no longer simply to teach software proficiency, but to foster a critical, creative, and ethical sensibility for designing within mixed realities where physical and digital layers are inextricably fused. This requires a pedagogy that is itself hybrid, capable of dissolving boundaries between theory and practice, analysis and synthesis,

the humanistic and the technological. The design studio, as a tradition of learning-by-doing within a collaborative, project-based environment, presents an ideal but under-theorized vessel for this task. Our approach seeks to explicitly theorize the studio's operation, framing it not as a mere application zone for pre-digested theory, but as a generative pedagogical infrastructure in its own right—a space where theoretical understanding is constructed through the very act of designing interventions in the world. This mirrors the paper's core argument: just as we propose museums should be designed as cognitive infrastructures for public engagement, we argue that the pedagogy for such future designers must be consciously structured as a cognitive infrastructure for professional *Bildung* (formation). This entails moving beyond skill transmission to cultivating a particular mindset: one that sees space, technology, and the human body as an interconnected system to be orchestrated for cognitive and affective ends.

This theoretical advancement carries a significant pedagogical imperative. Educating the next generation of museum professionals, designers, and technologists requires moving beyond traditional silos. There is a need for pedagogical frameworks that equip students to operationalize such complex, interdisciplinary theory into practice. This paper addresses this gap by presenting and analyzing a graduate design studio not merely as a case study but as the primary pedagogical site where the theory of "museums as cognitive infrastructure" was simultaneously taught, explored, and generated. The studio focused on the digital renewal of the "Sericulture and Weaving Illustrations" (*Canzhi Tu*), a Song Dynasty technological pictorial manuscript detailing the silk production process.⁴ Through this microcosm, the studio enacted a pedagogical methodology structured around four core design strategies, each corresponding to a dimension of cognitive infrastructure. This paper will therefore: 1) elaborate the theoretical framework of cognitive infrastructure; 2) detail the four-part pedagogical methodology as demonstrated in the studio; 3) discuss the outcomes and broader pedagogical implications; and 4) argue for the studio model as a vital engine for advancing both museum practice and theory.

THEORETICAL FRAMEWORK: THE SMART MUSEUM AS COGNITIVE INFRASTRUCTURE—A PEDAGOGICAL FOUNDATION

From Container to Catalyst: Spatial Mediatization

The traditional museum space, often a "container" following modernist "form follows function" logic, is re-envisioned here as an active cognitive medium. Drawing from Marshall McLuhan's axiom "the medium is the message," the museum's spatial organization—its sequence, scale, light, materiality, and circulation—becomes an active shaper of information and experience, a "script" or "walkable cognitive map" for understanding.⁵ This "spatial media" view intersects with architectural phenomenology. Philosopher Maurice Merleau-Ponty's concept of the "body schema" establishes that understanding is first built through bodily orientation and movement in space.⁶ Architects like Steven Holl apply this, focusing on how spatial phenomena (light, texture, sound) evoke bodily memory and affect.⁷ Pedagogically, this teaches students that space is not a passive vessel but a primary communicative and cognitive tool that must be designed with intention.

Embodied Cognition: The Bodily Ground of Knowing

Embodied cognition theory provides the psychological and philosophical cornerstone, challenging disembodied, computational views of the mind.⁸ It asserts that cognition, thought, and memory are fundamentally dependent on the body's attributes and its real-time interaction with the environment. In a museum context, this places the visitor's bodily practice at the center of the learning process. Understanding ICH is not only about historical facts but about "feeling" the rhythm of labor, material properties, and cultural meaning through simulated action, multisensory engagement, and spatial

navigation. Teaching this principle requires moving students beyond visual-centric design to consider tactile, kinesthetic, proprioceptive, and haptic channels, creating environments where knowledge representation is coupled with bodily sensation.

Media Ecology: The Digital as Cognitive Enhancement Layer

Media ecology theory posits that post-digital cognitive infrastructures necessarily fuse physical and digital dimensions.⁹ Digital technologies—AR, VR, spatial projection, sensor networks—should be understood not as gimmicks but as integral enhancement layers for constructing hybrid cognitive ecologies. They can compress or expand time-space, visualize invisible processes, offer personalized feedback, and record behavioral data. The pedagogical goal is to teach students to design for seamless cognitive augmentation, where digital information is semantically and perceptually linked to physical contexts, extending human perception and reasoning within a distributed cognitive system comprising the visitor's body, physical space, digital interface, and heritage itself. This integrated framework—rooted in embodied cognition, spatial mediatization, and digital ecology—forms the pedagogical foundation taught to students. It advocates for a holistic design philosophy where every element of the museum environment is considered for its role in guiding, enhancing, and transforming cognitive processes.

Pedagogical Methodology: A Four-Part Framework for Studio-Based Learning

To fully ground our methodological approach, it is essential to position our pedagogical model within a broader theoretical discourse on learning. The studio framework we describe functions as a meta-cognitive infrastructure for students. It scaffolds their journey from theoretical comprehension to practical innovation, explicitly modelling the very processes we wish them to implement. This aligns with Schön's concept of the "reflective practitioner" and the studio as a setting for "reflection-in-action," but extends it by integrating explicitly articulated, research-driven theoretical lenses as primary material for reflection.¹⁰

The graduate studio served as a laboratory to translate the above theory into a teachable and applicable design methodology. The process was structured around four sequential, interconnected strategies, each addressing a key dimension of cognitive infrastructure.

Pedagogical Strategy 1: Constructing Spatial Narrative & Sequence

Objective: To move students from designing displays to choreographing experiential narratives through space.

Theory Taught: Narrative as a fundamental cognitive tool for organizing experience. Spatial narrative uses sequence, vista control, scale, and rhythm to guide visitors in constructing coherent meaning through movement.¹¹

Studio Application (The "*Canzhi Tu*" Case): Students were tasked with deconstructing the original linear 23-step process – as illustrated in Figure 1. They analyzed it along three axes: temporal (categorizing steps into public rituals, family cooperation, individual labor), spatial (using space syntax to build a model of core, behavioral, and visual spaces), and trajectorial (mapping character movement) – as illustrated in Figure 2. The pedagogical outcome was a narrative reconfiguration: designing a dual-path experience. A VR path allowed an embodied, gamified first-person perspective ("positive space"), while a physical pavilion used architectural scenes and holography to represent collective rituals ("negative space") – as illustrated in Figure 3. Crucially, students designed narrative intersections where actions in VR triggered effects in the physical space, metaphorically linking individual labor to cultural continuum.

Pedagogical Value: This strategy taught students to think in four dimensions (space+time), to layer information, and to use architectural sequence as a storytelling device. It shifted their focus from presenting facts to designing for cognitive revelation and reflective association.



Figure 1. Deconstructing the original linear 23-step process of the "Canzhi Tu"

Figure 2. Temporal, spatial and trajectorial analysis of the "Canzhi Tu"



Figure 3. A narrative reconfiguration of the "Canzhi Tu"

Pedagogical Strategy 2: Activating Embodied Cognition

Objective: To transition student thinking from knowledge display to knowledge enactment.

Theory Taught: The principle is that "cognition is action." Designing for embodied cognition means creating interactive scenarios that prompt visitors' simulated, participatory movement, engaging procedural memory and empathy via mirror neuron systems.

Studio Application: Students built a database of typical body postures and gestures from the 23 steps – as illustrated in Figure 4. They then classified each step into "space-behavior mode," linking spatial types (e.g., "main space-observable accessory space") to action types – as illustrated in Figure 5. The design challenge was to create an interactive system using motion capture (e.g., Kinect) to map visitor movements to these historical models. Successful matching triggered contextual animations or information, creating an immediate "action-perception-knowledge" reinforcement loop. Spatial guidance (e.g., signs projected on the floor, light sequences) directed visitors to appropriate zones.

Pedagogical Value: This module forced students to analyze heritage at the granular level of body technique. It emphasized designing for low-barrier, high-feedback interaction, teaching them how to translate specialized bodily skills into publicly accessible, empathetic experiences.

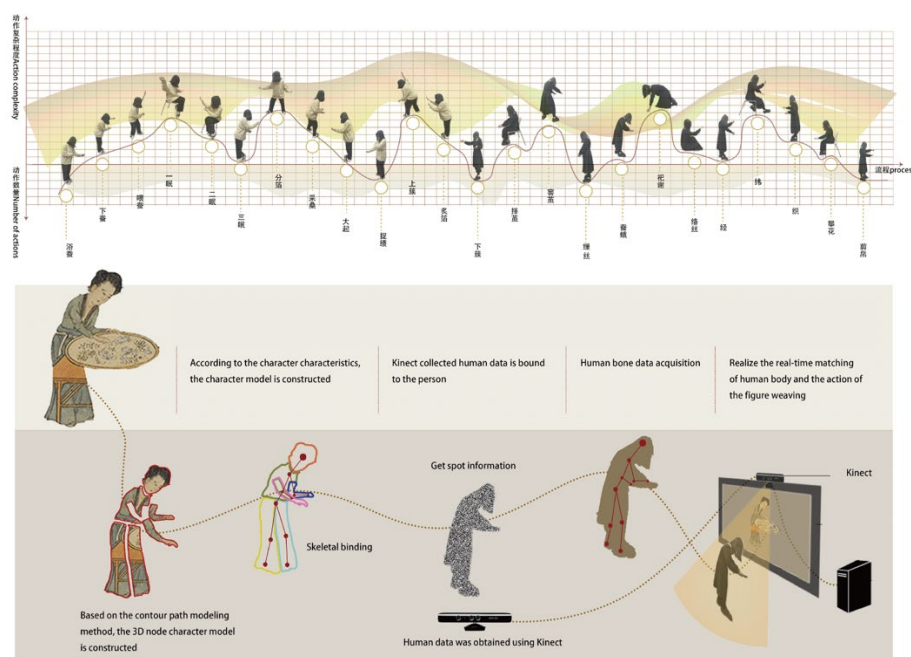


Figure 4. A database of typical body postures and gestures from the 23 steps

Figure 5. "space-behavior mode" linking spatial types to action types

Pedagogical Strategy 3: Crafting Atmosphere for Emotional Resonance

Objective: To teach students to design the affective, multi-sensory "mood" of a space as a direct conduit to cognitive engagement.

Theory Taught: Atmosphere as an "aesthetic reality" (Gernot Böhme) that directly influences emotion and attention. Emotion is not a distraction but a guide for attention and an enhancer for memory ¹².

Studio Application: Students conducted a semantic analysis of the *Canzhi Tu* and its poems, extracting affective keywords (e.g., toil, anticipation, serenity, joy). They mapped these onto the 23 steps to visualize an "emotional curve." Their design task was to translate this curve into spatial atmospheres using light, material, sound, and volume – as illustrated in Figure 6. For instance, "production spaces" were designed with low ceilings, focused light, and rough textures to convey the sense of isolation from focus; "ritual spaces" used soaring volumes, diffused light, and smooth silk installations for transcendence – as illustrated in Figure 7. A key project was a "Light Wall Cross Column," a hybrid structural-projection installation that could transform from an ordinary element into a sacred manifestation during key narrative moments.

Pedagogical Value: This strategy pushed students beyond the visual and functional to consider the synesthetic and affective power of space. They learned to use all sensory channels in concert to create immersive emotional journeys that deepen mnemonic retention and meaning-making.

Figure 6. a semantic analysis of the Canzhi Tu and its poems, extracting affective keywords and translation emotional curve into spatial atmospheres using light, material, sound, and volume

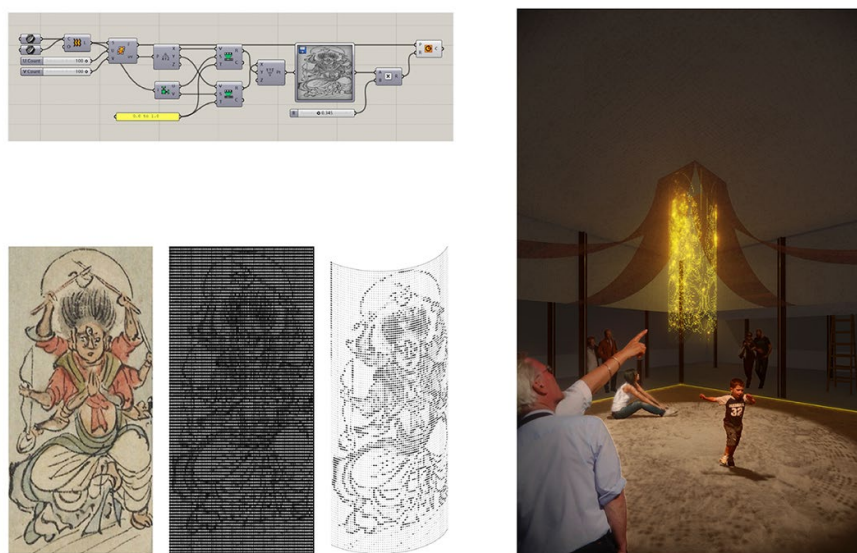


Figure 7. "ritual spaces" with soaring volumes, diffused light, and smooth silk installations for transcendence

Pedagogical Strategy 4: Providing Multiple Cognitive Paths

Objective: To instill a learner-centered philosophy that respects cognitive agency and diversity.

Theory Taught: Constructivist learning theory, which posits that knowledge is actively built by the learner.¹³ Nonlinear, network-like exploration spaces allow for personalized meaning-making based on interest, background, and pace.

Studio Application: Students constructed a detailed knowledge graph of all elements in the *Canzhi Tu* (e.g., tools, figures flora, fauna), tagging each with attributes: process, material, sensory modality, affective keyword, color code, etc – as illustrated in Figure 8. They then conceptualized an adaptive interface (e.g., a wearable AR device) that could sense visitor focus and recommend personalized exploration paths (e.g., a "tool evolution" branch path vs. a "seasonal change" branch path) – as illustrated in Figure 9. The physical exhibition room was conceived as a flexible, non-directive layout (archipelago or labyrinth) to support serendipitous discovery.

Pedagogical Value: This module introduced students to data structuring (e.g., knowledge graphs) and the ethics and mechanics of personalized experience. It emphasized designing for choice and agency, preparing them to create inclusive environments that cater to diverse learning styles and prior knowledge.

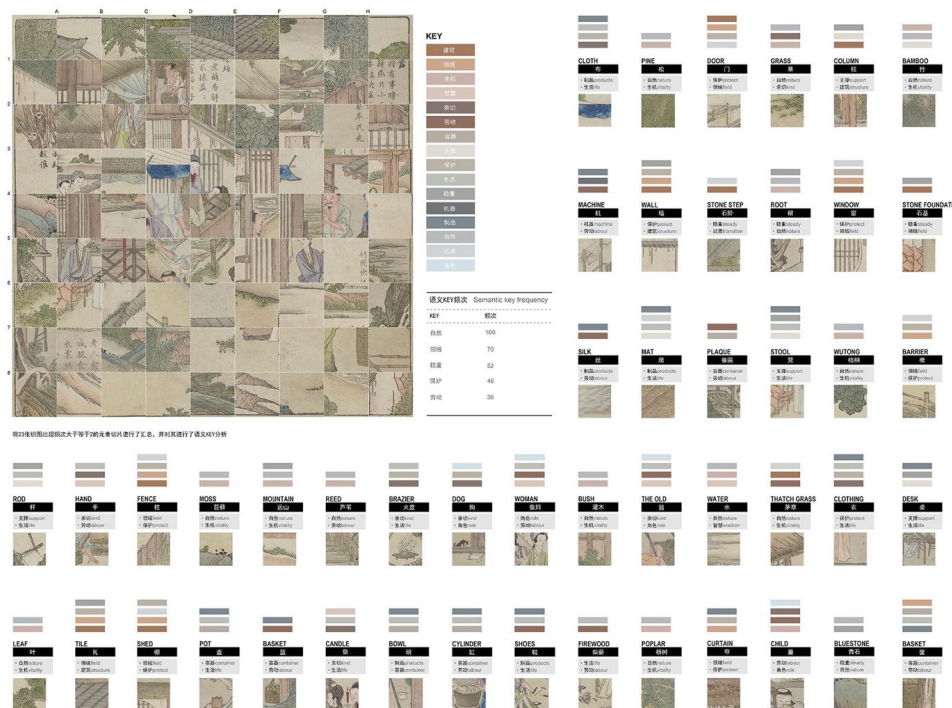


Figure 8. a detailed knowledge graph of all elements in the *Canzhi Tu*

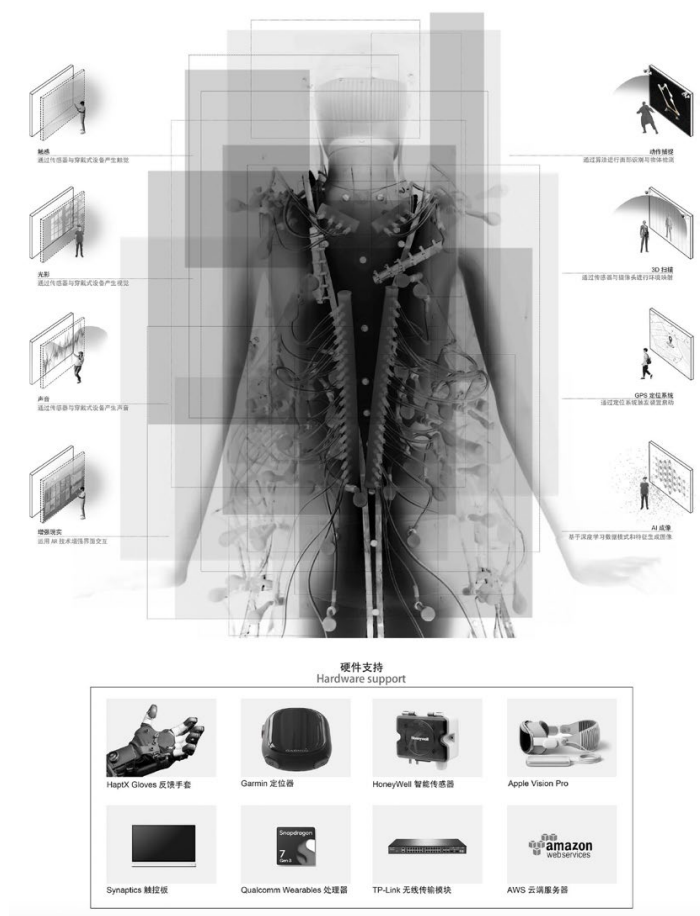


Figure 9. conceptualization of a wearable AR device that could sense visitor focus and recommend personalized exploration paths

DISCUSSION: PEDAGOGICAL OUTCOMES AND BROADER IMPLICATIONS

Synthesis and Cognitive Efficacy

The studio demonstrated how the four strategies work synergistically. The narrative framework provided structure, embodied interaction grounded learning in action, atmospheric design charged it with emotion, and multiple paths ensured accessibility and personal relevance. Pedagogically, students learned that effective cognitive infrastructure design requires this integrated approach, where spatial, bodily, affective, and interactive systems are co-designed.

Cultivating a Critical Technological Disposition

An essential, though often implicit, outcome of this pedagogy is the cultivation of a critical technological disposition in students. Working with technologies like motion capture, spatial projection, AR, and knowledge graphs is not presented as an end in itself, but always as a means to serve a higher-order cognitive or affective goal derived from the heritage content and theoretical framework. This constant back-and-forth between why (theoretical/interpretive goal) and how (technological/design execution) fosters a critical mindset. Students learn to interrogate technology: not merely “what can this tool do?” but “should it be used here, and if so, how can its use be nuanced to enhance rather than overshadow the human, embodied, and cultural experience?” This is a crucial form of literacy for the post-digital age, where the seduction of novel tech can easily eclipse substantive goals. This process helps students develop what could be termed techno-cultural

empathy—the ability to see technology not as a neutral tool, but as a mediating actor that shapes how culture is perceived, understood, and felt.

The Studio as a Model for Transdisciplinary Knowledge Production

Finally, this pedagogical model demonstrates the studio's potential as a site for transdisciplinary knowledge production. The challenge of designing cognitive infrastructure for ICH is inherently wicked; it cannot be solved by any single discipline. The studio merges architecture, interaction design, heritage studies, and computer science to create a shared epistemic space. The four-part framework provides the necessary boundary objects—concepts like “embodied interaction” or “spatial narrative”—that are malleable enough to be meaningful across disciplines yet concrete enough to guide collaborative action. Through this process, theoretical concepts are stress-tested, refined, and sometimes redefined. For instance, the philosophical concept of “atmosphere” (Böhme) gains tangible, teachable attributes through the students' attempts to craft it with light, sound, and material. Thus, the studio generates not just design prototypes, but also methodological and theoretical insights that feed back into the constituent disciplines. It exemplifies a mode of inquiry where teaching, learning, and research are productively entangled, offering a robust pedagogical response to the complex, emerging theories and technologies that define our time.

CONCLUSION: FROM PRESERVING HERITAGE TO CULTIVATING COGNITIVE CAPACITY

This paper has articulated the theory of “the smart museum as cognitive infrastructure” and, more critically, presented a detailed pedagogical methodology for teaching and applying this theory through design studio practice. By analyzing the process and outputs of a graduate studio focused on the “Sericulture and Weaving Illustrations” (*Canzhi Tu*) we have demonstrated a four-strategy framework—Spatial Narrative, Embodied Cognition, Atmospheric Crafting, and Multiple Pathways—that equips students to design museum environments as active, empathetic, and empowering cognitive systems.

The significance of this work is twofold. First, it provides a robust theoretical and practical framework for enhancing the sustainability and relevance of intangible cultural heritage in the post-digital museum. Second, and central to the theme of pedagogy, it offers a proven model for educating the next generation of practitioners. This studio-based approach teaches students not just about emerging theories and technologies but how to think with and through them to solve complex cultural problems. Ultimately, the goal shifts from merely preserving heritage objects to cultivating cultural cognitive capacity—designing infrastructures that empower publics to deeply understand, feel, and thoughtfully engage with the living pulse of intangible heritage.

NOTES

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FORMAL REVIEW AND IT'S BENEFITS TO STUDENTS

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INTRODUCTION

All college faculty assess. Assessment can take the form of papers, tests, and/or critiques. In many academic disciplines, assessment can be straightforward as there are definitive answers to questions or established evaluation frameworks (i.e. there are often answer keys in the back of a book). Most assessment, formative (development of “new content”¹) or summative (evaluation of student learning at the end of the semester), are for grades and are hopefully based on established criteria.

One of the main forms of assessment in Design Programs is a critique, a summative review of formative work. A critique “...requires expert judgement about how well students do in achieving stated outcomes.”² It is also a discussion, one-on-one or in a group, of the work presented based on the expected learning outcomes. They are to assist moving projects forward and involve presenting and defending produced work to develop the best solution. Faculty and students work together to find that best solution based on the assignment prompt or desired learning goal. Critiques happen throughout a semester and are typically based on project parts or milestones/deliverables that combine into a finished project proposal.

One drawback/criticism to the critique is that since design does not always have an answer key, assessment often exists in the gray area between the reviewers’ background/education/work experience and how well students express and defend their work. This gray area is where intentional or unintentional bias can arise. It is not always easy but as a Design Educator, one way to reduce the possibility for bias is to establish assessment criteria.

Establishing assessment criteria is essential to review as well as to promote objectivity. Develop assessment criteria, share it with the students prior to the assignment, allow time for students to review the criteria and ask questions, then use that criteria for review of produced work. It can be argued that educators feel those criteria explain the student’s performance for each project part. Meaning: you were expected to do this...and did great on this criterion scoring 8 of 10 possible points. However, in recent years, the students are displaying a new behavior on these assessments. They appear to be reviewing the number only (% out of 100) rather than the feedback (verbal or written). When, in truth, critiques are the actual grade and the number is the reflection of that grade. That means, students are missing important information about projects and how they can improve for the individual project, class, or academic year.

Just like students, collegiate academic programs also have assessment: university wide or national accrediting agency or both. Accrediting bodies list standards or essential competencies that a graduate must know by commencement. But what about students who are not yet ready for graduation? How do they know their performance compared to graduation expectations before they get there?

BACKGROUND

Prior to the development of the End of Semester Review (ESR), the faculty would meet at the end of each semester to evaluate student work. The mechanism for this review was a “desk critique (crit);” an activity where all students would display semester work on their desks (sketches, models, finals and any printed visuals that accompanied the final models) and the faculty would review when the student was not present. Desk crits functioned as a program-reporting to administration only activity and as a result, the comments were not shared with the students. Desk Critiques brought two items to light; the first was that though the classes were in the same program, each year-level was siloed requiring more “presentation” from the instructor-of-note to other year-level faculty. Needing to present caused faculty to, at times, take a defensive stance on displayed work. The second item was that these reviews often had less discussion regarding student work and more on anecdotal student behavior. After holding these reviews for multiple semesters the faculty asked, are these reviews benefiting the program through improvement of class delivery? And what was the point of all this if the review was not shared with the student?

The development of the ESR rubric began during the lead up to the program’s accreditation visit in 2018. Faculty were familiar with the desk crit and the work produced from second to fourth year but did not have good understanding or documentation of the foundational year. The only documentation the program could obtain was a first-year portfolio review; a project assigned at the end of the foundation studio. At that time, the first-year foundation studios were considered hands-on only and no computers were allowed...until the portfolio assignment. That portfolio assignment was seen as a gateway-evaluation for formal entry into the second year and the major program of study. This review was largely done by the larger school faculty not program faculty. Students received no feedback on their submission, just a letter stating: they had made it into the program, were on the wait list, or did not make it into the program but can retake the studio and try again. When gearing up for an on-site accreditation evaluation, the program collected work and set up a gallery exhibit. At that exhibit, the faculty reviewed the portfolios and realized that students were being gateway-evaluated unfairly as much of the work was appropriate for entry into the second-year of Industrial Design study. Again, these students received no feedback so how were they able to improve or grow without feedback?

Since the program was preparing for the next NASAD review and that preparation involved writing the self-study. In writing for the self-study, the faculty found this section in the NASAD handbook,³ V.D.4 which states:

4. Reviews and Evaluations. At some point prior to confirmation of degree candidacy, member institutions must require portfolio reviews or other evaluations consistent with the purpose of the degree as part of the admission decision. Member institutions are urged to require such reviews and evaluations prior to matriculation.

NOTE: Some institutions have open admission policies. In such cases, portfolio reviews and evaluations associated with confirming degree candidacy must occur no later than the end of the first half of the degree program.

“...or other evaluation consistent with the purposes of the degree” and “...must occur no later than the end of the first half of the degree program” were key statements for the program providing permission to reimagine what the evaluation could be. With that, the faculty delved into the NASAD Handbook Section *X.F.3. Essential Competencies, Experiences, and Opportunities*⁴. That comprised a list a.-k. that describe all necessary skills needed for a fourth-year student of an Industrial Design Program to exhibit in preparation for graduation.

As with all design, an iterative design process is a way of continually assessing any design, to find areas of improvement, to incorporate new idea/opportunities, test, analyze, and redeploy. For this project, the faculty implemented “Development Iteration or rework.”⁵ Simply put, the faculty have

continually worked to develop and improve this rubric as well as the review process, remove unnecessary parts, and or streamline workload and comprehension. Over 10 years the faculty created four review versions; each with reasons for change. The fourth version was used in the Fall 2025 End of Semester Review. The following are what the faculty developed and reasons for change.

Review Version ONE

NASAD' Section *X.F.3. Essential Competencies, Experiences, and Opportunities* listed what students should be able to demonstrate at graduation. The statement of the portfolio review was based on student's summative representation of formative studio projects. Because of this the program focused on the specific competencies that applied to studio classes; other competencies listed were satisfied in classes such as lecture-based or Seminar-based and were not included in the review as they were reviewed in the appropriate classes. With that filter, the list was condensed to six evaluation criteria.

Figure 1. First Four Academic Years of the End of Semester Review Rubric.

The list developed overarching competencies for topics such as design, sketching (digital or analog), modeling, research, and their presentations and could be viewed as a rubric. Each overarching competency also had sub-competency's that would relate to specific aspects of the main competency. Students were rated on the sub competencies, 1–10, on how the faculty saw their performance. Version ONE was in place for 4 years, with minor updates, see Figure 1., and any collected data was still only shared with the administration. The faculty saw the importance in the form but did not feel it served the purpose of review for the student or for our accrediting requirements.

Review Version TWO

Beginning in the Fall of 2021, the faculty revised the rubrics to provide feedback for the program and student. At this time, the University's Office of Institutional Effectiveness developed a new way of evaluating student learning through terms that were appropriate per year of study. For version TWO, the faculty added levels of achievement per criterion utilizing the terms from the Universities institutional assessment. Those terms were: *Introduction*, *Exploration*, *Understanding*, and *Mastery*. At the time the university used these levels to describe student progress through their academic career. For example, exploration was synonymous with second-year work. The terms were appropriate except for Mastery as the program did not feel an undergraduate education should expect mastery without a master's program. The program used the term *Synthesis* as it implied students would exhibit a level of mastery for applied skills and learning suitable for entry into the profession. Definitions of the terms and criteria were shared with the students prior to the review. In addition to the definitions of the terms, the faculty gave a description of the review and made it clear that the review was for student and program growth, not for a grade. Students would receive a grade for work in their class from their instructor-of-note but any comments from other faculty were seen as opportunities for growth.

Figure 2. Rubric Pages Version 2.

The updated review criteria competencies were: Information Knowledge and Skills, Investigation Research & Problem Definition, Coordination Teamwork & Industry, Conceptualization Creative Problem Solving, Visualization Organizing & Exploring Information, and Communication.

Students were reviewed at an End of the Semester Review (ESR), a digital presentation of the main studio project from the semester that was held each semester beginning in second year and ending in the graduating semester. "...evaluation must involve more than a single appraisal at any one time to see if whether change has taken place, it is necessary to make an appraisal at an early point and other appraisals at other points to identify changes that may be occurring."⁶ Industrial Design studios, second through fourth, met each Monday, Wednesday, and Friday for class and the last three periods of the semester would be used for the review. Each year, second through fourth, would meet in a lecture hall during the scheduled class periods and present to the faculty and student body. In this way, all would be able to see each-others work, hear faculty feedback, and practice public speaking. After the review, the faculty would complete the review rubric and email it to the students. In this version, the faculty noted colors for the Fall and Spring semesters. In this way, there was a graphically visual representation of student growth from the Fall to Spring semester.

Figure 3. Rubric Pages Version 3.

Review Version THREE

In the revision three iteration, criteria were broken into an overarching competency with 1–4 sub-competencies used to measure student performance. In an effort to be more objective and fairer to the students, the faculty decided to review individually using the terms from the previous version, Introduction, Exploration, Understanding, and Synthesis, but this time the levels were connected with

a number, 0–4, rather than a color square, and the scores would be averaged and shown from both Fall and Spring to see if there were an improvement or regression. But still the process did not feel fully correct.

FALL 2025 REVIEW VERSION

In the summer of 2025, the faculty were not satisfied with the current review rubric, as with all design activities, continued to iterate how the procedure works, what is actually beneficial to students and what will allow them to truly perceive expectations for each year culminating at graduation. Like it is said in *The Art of Innovation*,⁷ “answers lie within.” We reached out to the students, as a collaborative exercise and to get their input, in the form of a survey.

Survey Questions using Microsoft Forms

This survey is to review-the-End-of-the-Semester Rubrics that began in the Fall of 2021 and have continued to the present semester. The Industrial Design Faculty would like to hear your thoughts.

Have you received an emailed end-of-the-semester rubric yet? Y/N (if no, please navigate to the bottom of the form and click submit)

If you did receive an emailed end-of-the-semester rubric, did you review your feedback? Y/N

There were two types of feedback on the form:

- the numeric value representing the faculty’s review of your achievement level
- Each faculty members specific comments on your presentation and final model(s)

The next two questions are based on these two types of feedback.

Was the numeric feedback helpful? Y/N

Would you please explain your answer

Were the faculty member comments feedback helpful? Y/N

Would you please explain your answer

Do you have any suggestions on the form?

This exercise brought a few things to light: the achievement levels, *Introduction, Exploration, etc.*, were not entirely clear and could be better defined, the process could focus more on the presentation rather than the models, and most importantly for the faculty to reference the review at the beginning of the next semester to help students plan a path forward for the current semester. The new format allowed for numeric values to evaluate the sub-competencies as well as opportunity for faculty to elaborate on their numeric values by adding comments specific to each overarching competency. The numeric values were defined in greater terms:

Underdeveloped (1–4) Poor work (not meeting the basic requirements)

Developing (5–6) Good work (meeting the basic requirements)

Resolved (7–8) Very good work (exceeding the basic requirements)

Well-Executed (9–10) Exceptional work

Each numeric value was based on a ten-point scale, something students are familiar with, but provided greater range for faculty to evaluate presented work. The Fall 2025 Review Version delved into the pervious review rubrics, combined them with the current rubric, and has greater connection with the NASAD standards⁸, either directly or interpreted. This form broke the review into two pages; the first page was the overall objective per criteria with explanations on how the faculty could view the work. The next page was an opportunity for the faculty to provide some type of score as well as directed comments on how the student performed, what they did well and what they could put forth more effort in the upcoming semester.

Figure 4. Fall 2025 Rubric Pages.

CONCLUSION

This case study explored the design of review rubric, how it was originally developed, how it has undergone revisions, and how it can be of more value to the students. The rubric was tested in December of 2025 and after completion, the faculty met to review the strengths and weaknesses of the document. Focusing on the presentation allowed for more directed comments and stronger feedback during the review resulting in large amount of written feedback for the document. However, issues arose with some criteria, e.g. research and context, as it was difficult for meaningful written comments for students under the fourth year. In addition, the completion of the rubric by all faculty took longer than anticipated which resulted in the students not receiving their feedback until the new semester had begun. When feedback was shared with the students, the faculty took time to include a discussion with each student so they could request clarification and for the faculty and student to plan that path forward for success.

Taking this information into consideration, there will be another revision in the summer of 2026 but the same rubric will be used during the Spring Semester as it is only fair to evaluate students consistently rather than changing during the academic year. Expectations for the next revision will connect the rubric to the syllabus course learning objectives, for each year of study, for what students should know at the end of the academic year not just the end of the semester. Connecting with the course learning objectives will provide a set of criteria that are year specific and will scaffold learning objectives throughout their academic career.

NOTES

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- ² Meredith Davis. *Teaching design: A guide to curriculum and pedagogy for college design faculty and teachers who use design in their classrooms*. New York, NY: Allworth Press, 2017,79.
- ³ National Association of Schools of Art and Design. *Handbook*. 2016–17 ed. National Association of Schools of Art and Design, 2016. <https://nasad.arts-accredit.org/accreditation/standards-guidelines/archive/>, 87.
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- ⁶ Ralph Winfred Tyler,. *Basic principles of curriculum and instruction*. Chicago, Ill: University of Chicago Press, 2013, 106.
- ⁷ T. Kelley & J. Littman. The Art of Innovation: Lessons in creativity from ideo, America's leading design firm. Currency/Doubleday, (2001) 71.
- ⁸ National Association of Schools of Art and Design. *Handbook*. 2024th–25th ed. National Association of Schools of Art and Design, 2024. <https://nasad.arts-accredit.org/accreditation/standards-guidelines/archive/>, 92.

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SEED AI AS A LEARNING COMPANION: EMBEDDING REGENERATIVE THINKING IN EARLY-STAGE DESIGN PEDAGOGY

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INTRODUCTION

Design education reflects the accelerated tempo of professional creative practice, where speed, deliverables and output-oriented workflows frequently shape studio settings.¹ This can create expectations of rapid production and potentially diminish the time and attention needed for critical inquiry, and engagement with contextual complexity.²

In such environments, the desire to stabilise uncertainty through premature visualisation may eclipse the slower interpretive work of understanding the social, ecological, and systemic conditions that relate to a design project. These tendencies are particularly significant in early-stage design processes. Students who are constrained by limited discretionary capacities can gravitate toward solutionism, and narrow the conceptual field before grasping the systems that shape a design problem.³

This paper attempts to address these concerns through a pedagogical framing of AI for regenerative design education and practice.⁴ It presents an alternative approach to design reasoning that emphasises regenerative thinking and systems awareness from the outset of a project. *SEED (Social and Ecological Engagement in Design)* is a framework-in-development to support students and designers in foregrounding relationships among people, place and planet before design outcomes are formulated.⁵ SEED aligns with wider movements in design research that call for a deeper understanding of ecological interdependencies, cultural contexts, and the social conditions in which design operates.⁶ Through the SEED framework, *SEED AI* functions as a learning companion that makes reflective and contextual design reasoning visible through a conversational interface and educational scaffold.⁷ Rather than generating design outcomes or treating the ecological as an afterthought, SEED AI encourages learners to articulate context and stakeholders (both human and non-human), identify problem frames, expand ideation and creative possibility, and cultivate reflective action for planetary health.⁸

The aim is to: situate SEED within ongoing discussions on regenerative and systems-oriented design pedagogy; clarify how SEED AI translates the SEED framework into an accessible, structured learning interaction; and offer early insights from implementation of SEED AI across secondary and tertiary educational settings.

Together, SEED and SEED AI can strengthen ideation and early-stage regenerative design literacy. Supported by an intuitive activation layer, students are encouraged to develop a responsive, ethical, and socially and ecologically attuned design approach. The proposition is simple: better beginnings lead to better design trajectories.

THE PEDAGOGICAL IMPLICATIONS: SPEED, OUTCOMES, AND EARLY CERTAINTY

Studio-based learning has long been central to design pedagogy, yet it is also a place where norms from professional practice can be reproduced. The privileging of rapid iteration, visualising artefacts, and aesthetic decisions inadvertently position tangible outcomes as the primary indicator of progress and arguably, commercial success.⁹

Students may internalise these cues, associating design competence with the ability to produce quickly rather than reasoning deeply. Design literature highlights that accelerated cultures of design practice can narrow the space for systems-oriented inquiry and ecological understanding.¹⁰ Addressing complex design challenges requires moving beyond fast, problem-solving orientations toward holistic forms of sense-making that engage with living systems and social relationships.¹¹

A recurring phenomenon in learning environments is premature convergence, where students commit to a particular idea or aesthetic direction without engaging or sufficiently understanding the wider problem context.¹² This inclination reflects a well-documented pattern in creative practice in which designers often seek an early visualisation or stabilising concept in order to reduce uncertainty and establish something tangible.¹³ While providing orientation, this tendency can impede more expansive or critical engagement. It may also limit opportunities and reduce the space in which alternative interpretations, values and systemic implications might otherwise be explored.¹⁴ In educational settings, this is amplified by assessment timelines and the pressures of concurrent coursework. Students may not necessarily struggle to generate ideas; however, difficulty can occur in framing the underlying problem, identifying the relevant stakeholders, and considering the link between social and ecological factors that relate to particular design challenges.

The early stages of a project are pivotal for encouraging reflective, ethical and systems-aware thinking.¹⁵ Design education must nurture an ability to perceive the interconnectedness of human and non-human systems before moving into any act of creative intervention.¹⁶ This requires a shift toward practices of contextual attunement, slow, thoughtful observation, and iterative reframing. However, such intentions can collide with social, institutional, and commercial structures that continue to reward production and measurable outputs. It is within this tension that SEED is situated—again, better beginnings lead to better design trajectories. The SEED framework urges designers to pause and treat early ideation as a process of understanding relationships, contexts and consequences. SEED positions attention to systems, communities, and ecological implications as integral to shaping design intent.

THE SEED FRAMEWORK: AN ADAPTIVE SCAFFOLD FOR REGENERATIVE THINKING

SEED operates as a flexible, adaptive and iterative structure that responds to the ephemeral nature of the human imagination and entangled conditions in which design takes place. The SEED framework centres the relationships among people and their connection to place and planet as the starting point for meaningful design engagement.¹⁷ It foregrounds understanding before intervention, encouraging designers to situate their work within wider socio-ecological dynamics.¹⁸

While undergoing development as part of doctoral research, SEED is motivated by contemporary design theories concerned with social and ecological dimensions of practice. Researchers working across social design, design for social innovation, transition design, and regenerative design argue that design must move beyond procedural problem-solving to a mode of inquiry that is attentive to values, cultures, and long-term ecological vitality.¹⁹ SEED responds by positioning ethical and ecological considerations as imperative to early-stage design inquiry, rather than as peripheral information.

SEED is comprised of interrelated phases that prompt the beginnings of conceptualisation (Figure 1). These phases are not fixed or sequential; instead, they provide a rhythm for thinking that can expand, contract, or loop back depending on the needs of the given project.²⁰ The fluid and flexible scaffold of

SEED is deliberate. Rather than adopting a prescriptive process logic, it encourages curiosity and adaptability for designers to engage with the complexity of a problem while maintaining orientation, clarifying intent, and sharpening focus. SEED is less a model of “how to design” and more an invitation to reframe the act of design as a participatory, relational, and regenerative endeavour.

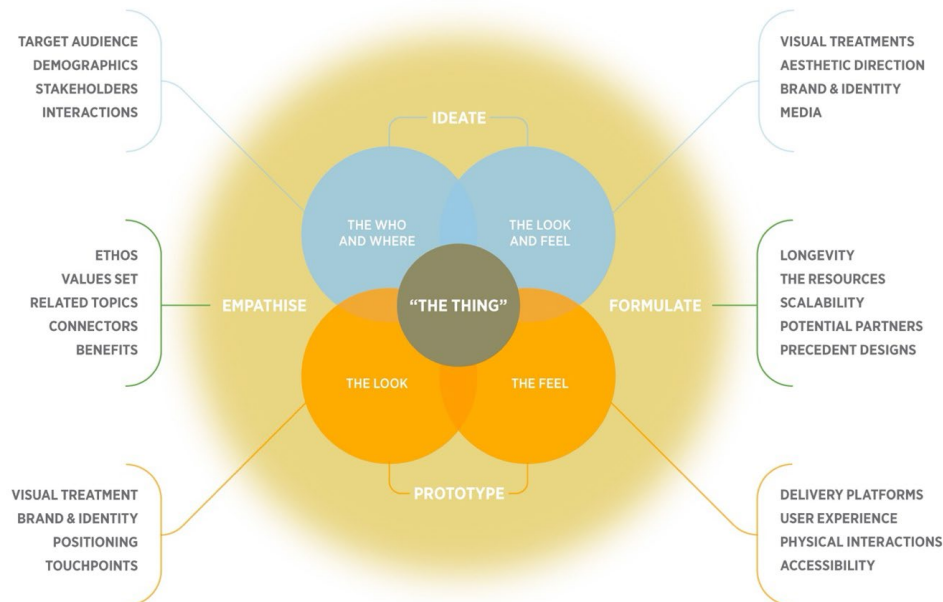


Figure 1. The SEED framework showing the interrelated phases of design inquiry.

Source: Lahoud et al., *Social and Ecological Engagement in Design (SEED)*, ACUADS Conference Proceedings, 2024.

Design intent as emergent

SEED positions design intent as “The Thing” that emerges through engagement across all phases. This reflects an understanding of design as an evolving process that is shaped through dialogue and interaction with context, stakeholders, and ecological conditions. The interconnected structure encourages designers to grow ideas relationally and approach their creative practice with care and responsiveness.²¹

THE ROLE OF AI IN DESIGN PEDAGOGY: CAUTION AND POTENTIAL

The rapid emergence of openly accessible and user-friendly AI tools has introduced a degree of uncertainty within design education. While artificial intelligence has been evolving for decades, its recent integration into popular creative software has stirred societal, policy, and pedagogical debate. AI may accelerate aspects of creative production, yet design education remains fundamentally concerned with developing the reflective and relational capacities in which students learn to exercise judgement.²² The risk is not necessarily that AI will replace design practice, but that it may inadvertently prioritise efficiency and immediacy at the expense of human cognitive qualities.

In design, it is often within ambiguity, uncertainty, and the discomfort of not knowing where to begin that experimentation and the iterative refining of design intent occur.²³ These conditions encourage the development of judgement, problem framing, and reflective practice over time. When AI tools provide rapid answers or generate highly polished artefacts, they can reinforce habits that narrow the space for critical reflection, marginalise ethical consideration, and reduce opportunities for developing foundational skills.²⁴

Despite these arguments, to position AI entirely as a threat in education is to overlook its potential contribution. A growing body of research suggests that, when used deliberately, AI can support learning and help students reflect, organise ideas, and think through problems.²⁵ In design contexts, where the beginnings of a project may feel daunting, AI tools can assist by structuring information or making emerging ideas visible. Used in this way, AI does not replace creative work; instead, it provides a point of reference that allows students and designers to explore with curiosity, confidence, and focus. The question here is not whether AI belongs in design education, but what are the ways it can meaningfully enrich the pedagogical aims of the discipline. Rather than examining *if* AI should be used, the value seems to depend largely on *how* AI is implemented.²⁶

Another dimension of the debate highlights the broader ethical and ecological implications of AI. Educators increasingly raise concerns on how AI systems can reflect particular cultural assumptions, embed data biases, and rely on extractive computational and material demands.²⁷ In response, integrating AI into design education therefore requires critical engagement with what AI can (and cannot) do, and with the systems, values, and responsibilities that underpin it. This echoes regenerative design philosophies which emphasise the need to design for harmony with living systems and examine the long-term impact and consequences of any intervention, including technological ones.²⁸

Within this complexity, SEED AI is developed to strengthen—rather than replace—the cognitive work that students and designers must undertake. It is situated in the gap between caution and potential, and offers a model in which AI becomes a learning partner in the slow and careful work of understanding.

SEED AI: OPERATIONALISING REGENERATIVE IDEATION

Although SEED offers a structure for initiating design inquiry, educational experience shows that frameworks alone do not guarantee consistent application. Students may understand SEED in practice yet can still default to rapid output-making when studio and assessment pressures intensify. Therefore, the challenge is not to simply state the principles and importance of regenerative beginnings, but to create the conditions in which learners can apply them in real time. SEED AI is designed specifically to meet this need. It functions as a collaborative activation layer that helps students orient their thinking before committing to form.

SEED AI is intentionally restrained in scope. It does not automate design processes. Instead, it operationalises a pedagogical rhythm to activate the SEED framework. Through simple and ongoing dialogue, prompting and reflective questioning, SEED AI enables a space where students can become aware of the social and ecological implications of their design project before aesthetic or technical decisions are made. More specifically, SEED AI supports regenerative design reasoning in an accessible, intuitive, and personalised manner.

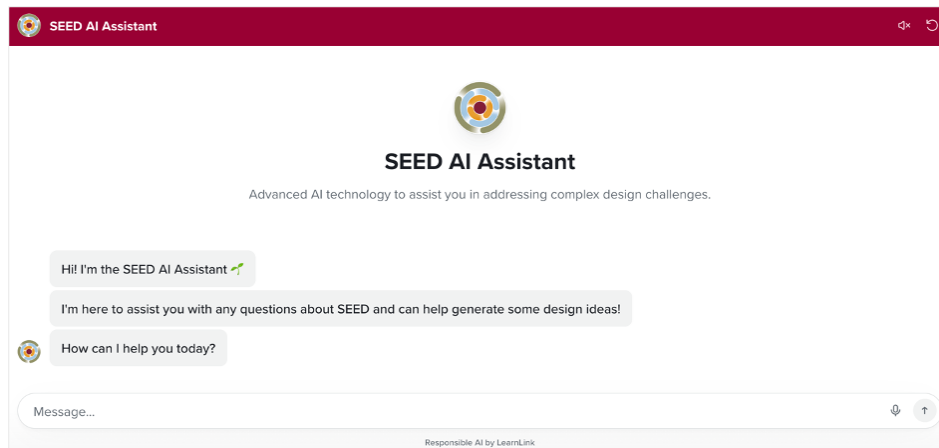


Figure 2. SEED AI invites learners to articulate an early-stage design question or challenge.

Interaction as pedagogy

SEED AI is built on the premise that learning interactions are pedagogical. Students are prompted to express what they know, what they assume, and what remains unclear to encourage questioning and fluency in describing the context of the broader challenge. This approach draws on research showing that expression, explanation and self-questioning can improve reasoning and support learning, particularly in addressing open-ended problems.²⁹

As such, the intrinsic educational value of SEED AI is revealed within its simple dialogic format (Figure 2). Each prompt is small to deliberately stimulate interpretation rather than direct it. In this sense, SEED AI reinforces the kinds of introspection and judgement that are central to design literacy. It does not substitute the teacher or the studio environment; instead, it complements and provides continuity that extends the contemplative space of design beyond the physical, practical, and logistical constraints of class time.

ORIENTING REGENERATIVE DESIGN THINKING

The SEED framework functions as a guiding lens for SEED AI in activating a set of *pedagogical moves* to collectively orient thinking at the onset of a design brief. They assist students to recognise stakeholder relationships, engage with place and context, and act with an awareness for the social responsibilities and ecological consequences of their design decisions.³⁰ Additionally, an embedded feature of SEED AI is its alignment with the *United Nations Sustainable Development Goals (UN SDGs)*, which enables learners to map relevant goals directly to their specific project. This helps to situate design inquiry within an established system of broader global agendas, while remaining grounded in local conditions, histories, concerns, and actions.

PEDAGOGICAL MOVES ACTIVATED BY SEED AI

SEED AI moderates the pace of interaction to encourage understanding, sharpen focus, and exercise critical judgement. Rather than offering immediate direction or outputs, it relies on structured questioning and reflective prompts that unfold gradually as the dialogue develops. The following outlines the pedagogical moves activated by SEED AI to support early-stage design inquiry, without directing toward predetermined outcomes.

Sensing context

Initially, SEED AI invites learners to describe the situation they are addressing in their own terms. Subsequent prompts focus attention on people, place, and broader interrelated systems to widen the perceptual field beyond the immediate task.

Surfacing assumptions

Students often approach design briefs with implicit assumptions shaped by prior experiences, cultural norms, disciplinary habits or contextual expectations. Through personalised prompting, SEED AI encourages learners to describe what they believe is occurring, why it matters, and signals to them which perspectives may be absent or underrepresented.

Expanding possibility

Rather than proposing solutions, SEED AI provides cues to consider multiple directions, alternative framings, and offers existing precedents and reference material that are relevant. This maintains openness and creates space for conceptual depth, innovation, and exploration before evaluation.

Clarifying intent

In regenerative design contexts, this move is critical in support of value-led reasoning, by connecting intent to social and ecological implications and ethical considerations rather than to form and aesthetics alone. This emphasis echoes longstanding critiques that argue designers must take responsibility for the broader consequences of their decisions.³¹

Cultivating reflection

Students are encouraged to consolidate their reasoning by reflecting on impacts, alignment with stated values, stakeholders, problem frames, and relevant UN SDGs where appropriate; strengthening the ability to communicate the rationale behind their design choices. In this sense, SEED AI assists in rehearsing the kinds of habits and orientations that regenerative design and professional practice demands. Reflection at this early-stage is an essential part of learning to approach design responsibly and coherently.³²

WHY THESE MOVES MATTER

The pedagogical intent of SEED centres on students and designers developing the capacity to identify relationships and their systemic implications, and act thoughtfully with an awareness of social and ecological contexts. Systems and ecological literature consistently emphasise that such awareness cannot be appended to a design process after the fact; but must be established at the outset through how problems are framed and explored.³³ The active moves of SEED AI supports place-based sensitivity and the concept of “cosmopolitan localism”, by situating design practice within personalised contexts while attending to wider concerns.³⁴

PROMISING SIGNS OF SEED AI IN DIVERSE TEACHING CONTEXTS

Early uses of SEED AI provide insight into how students can engage with a tailored AI platform at the start of their design projects. These examples are not presented as formal evaluation, but as cases that have informed the educational use and development of SEED AI and the SEED framework. They also sit within broader design pedagogy literature of what knowledge, skills, attributes and experiences are necessary in design practice.³⁵

A consistent observation across teaching contexts is that SEED AI appears particularly supportive for students who are unfamiliar with design or working outside their disciplinary comfort zone. In

interdisciplinary workshops involving culturally and linguistically diverse students from business, science and humanities backgrounds, SEED AI provided an accessible entry point into design reasoning and multilingual translator for early-stage design inquiry. Students typically began with broad environmental concerns or loosely defined interests and—within a short studio session—were able to present clearer problem frames, identify relevant stakeholders, and propose initial directions for their concepts. Once this orientation was established, SEED AI was set aside and students progressed into hand-generated design activities, including sketching and poster development. Rather than replacing creative work, SEED AI assisted with the thinking that precedes it, supporting reflective sense-making prior to production.³⁶

In longer studio-based subjects, learners have used SEED AI more iteratively. Some employ it at the beginning of each project stage to clarify uncertainties, while others revisit earlier conversational threads to reflect on how their reasoning and approach has evolved.

Additional scenarios suggest that SEED AI can support equity and accessibility in design education. For those who are less confident when participating in critiques, SEED AI helps students formulate their rationale privately before entering class discussions. This encourages participation in ways consistent with inclusive pedagogical strategies, and reduces the entry barrier and social frictions that may be present in group dialogue.³⁷

While these examples do not constitute formal empirical findings, they signal the benefits of SEED AI within educational settings. Formal evaluation and refinement are ongoing.

LIMITATIONS, SAFEGUARDS AND FUTURE SCOPE

SEED AI is not a replacement for human expertise, creative imagining, cultural and traditional knowledge, scientific or ecological understanding. It does not empathise with local histories, community and personal relationships, or determine the appropriateness or feasibility of potential design directions or approaches. SEED AI has been intentionally designed with constraints, safeguards and regenerative design principles embedded within its prompt structure and interaction flow. These mechanisms guide the system toward reflective inquiry rather than directive output, acknowledging the ethical responsibilities associated with the use of AI in education.

Given the evolving nature of the technology, it is made explicit to learners that SEED AI-generated content may contain inaccuracies or partial perspectives and requires critical interpretation. Evaluation and refinement of SEED AI is ongoing, with future work focused on formal pedagogical assessment, ethical review processes and deeper integration across educational and professional contexts.

CONCLUSION

The ecological paradox of using computational systems for regenerative aims is not negated, but navigated with constraint and pedagogical intentionality. By positioning AI as a learning companion for early-stage orientation and reflection, SEED AI demonstrates how such technologies can support students without displacing human judgement, creativity or responsibility. This balanced approach allows SEED AI to contribute to discussions around AI in design education and practice while remaining aligned with the values it seeks to nurture.

NOTES

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- ⁴ Matthew Lahoud, "SEED AI as a Learning Companion: Embedding Regenerative Thinking in Early-Stage Design Pedagogy," *Pedagogy 2025: Emerging Theories, Teaching & Technologies*, AMPS Conference, UK, USA, Belgium, November 20, 2025. This paper expands the theoretical framing and develops a fuller account of the pedagogical implications of SEED AI.
- ⁵ Matthew Lahoud et al., "Social and Ecological Engagement in Design (SEED): A Novel Integrative Approach for Just Transitions to the Symbiocene," paper presented at Thriving Futures: ACUADS Conference 2023, *Thriving Futures: ACUADS Conference 2023*, 2024, <https://acuads.com.au/conference/article/social-and-ecological-engagement-in-design-seed-a-novel-integrative-approach-for-just-transitions-to-the-symbiocene/>.
- ⁶ Victor J. Papanek, *Design for the Real World: Human Ecology and Social Change*, 1st American ed. (New York: Pantheon Books, 1972); Ezio Manzini, *Design, When Everybody Designs: An Introduction to Design for Social Innovation*, Design Thinking, Design Theory (Cambridge, Massachusetts: The MIT Press, 2015); Terry Irwin, "Transition Design: A Proposal for a New Area of Design Practice, Study, and Research," *Design and Culture* 7, no. 2 (April 2015): 229–46, <https://doi.org/10.1080/17547075.2015.1051829>.
- ⁷ Matthew Lahoud, "SEED AI Assistant Tool," 2024, <https://www.socialdesign.com.au/seed-ai-tool/>. SEED AI is a publicly accessible learning companion designed and developed by the author. The interface and prompts shown are illustrative of use in teaching and educational contexts.
- ⁸ Sarah Whitmee et al., "Safeguarding Human Health in the Anthropocene Epoch: Report of The Rockefeller Foundation–Lancet Commission on Planetary Health," *The Lancet* 386, no. 10007 (November 2015): 1973–2028, [https://doi.org/10.1016/S0140-6736\(15\)60901-1](https://doi.org/10.1016/S0140-6736(15)60901-1).
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- ¹¹ Ezio Manzini, *Design, When Everybody Designs: An Introduction to Design for Social Innovation*, Design Thinking, Design Theory (Cambridge, Massachusetts: The MIT Press, 2015).
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- ¹⁷ Lahoud et al., "Social and Ecological Engagement in Design (SEED): A Novel Integrative Approach for Just Transitions to the Symbiocene."
- ¹⁸ Stephen Boyden, *A Biorenaissance: The Human Place in Nature - Past, Present and Future*, ed. Karina Bontes Forward, with Leo Robba and Matthew Lahoud (Anembo: Old Hillside Publishing, 2023). It is important to acknowledge that the collaboration with Professor Boyden on the design and production of his final book has been inspirational to the ongoing development of this research.

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²⁰ Lahoud et al., "Social and Ecological Engagement in Design (SEED): A Novel Integrative Approach for Just Transitions to the Symbiocene."

²¹ Lahoud et al.

²² Neil Selwyn, *Should Robots Replace Teachers? AI and the Future of Education*, Digital Futures Series (Cambridge Medford, MA Polity, 2019).

²³ Vinod Goel and Peter Pirolli, "The Structure of Design Problem Spaces," *Cognitive Science* 16, no. 3 (July 1992): 395–429, https://doi.org/10.1207/s15516709cog1603_3; Rianne Valkenburg and Kees Dorst, "The Reflective Practice of Design Teams," *Design Studies* 19, no. 3 (July 1998): 249–71, [https://doi.org/10.1016/S0142-694X\(98\)00011-8](https://doi.org/10.1016/S0142-694X(98)00011-8); Richard Boland and Fred Collopy, eds., *Managing as Designing* (Stanford, CA: Stanford Business Books, 2004).

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²⁷ Kate Crawford, *Atlas of AI: Power, Politics, and the Planetary Costs of Artificial Intelligence* (New Haven London: Yale University Press, 2021).

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³¹ Papanek, *Design for the Real World: Human Ecology and Social Change*.

³² Design literature consistently emphasises the importance of early-stage orientation, reframing, and reflective articulation in supporting creative judgement. See Nigel Cross, *Design Thinking: Understanding How Designers Think and Work*, First edition (London, England: Zed Books, 2011), <https://doi.org/10.5040/9781474293884>; Kees Dorst, "The Core of 'Design Thinking' and Its Application," *Design Studies* 32, no. 6 (November 2011): 521–32, <https://doi.org/10.1016/j.destud.2011.07.006>; Richard Buchanan, "Wicked Problems in Design Thinking," *Design Issues* 8, no. 2 (1992): 5, <https://doi.org/10.2307/1511637>; Research on reflective practice further highlights the role of articulation and early reflection in strengthening design reasoning; see Donald A. Schön, *The Reflective Practitioner*, 0 ed. (Routledge, 2017), <https://doi.org/10.4324/9781315237473>; Jennifer A. Moon, *A Handbook of Reflective and Experiential Learning*, 0 ed. (Routledge, 2013), <https://doi.org/10.4324/9780203416150>; Work in creative ideation and synthesis also underscores the value of delaying judgement to support originality and conceptual breadth; see Jon Kolko and Chris Connors, *Thoughts on Interaction Design: A Collection of Reflections* (Burlington, MA: Morgan Kaufmann, 2010).

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PEDAGOGY IN ACTION: USING THE HISTORYMAKERS DIGITAL ARCHIVE TO BRIDGE ACADEMIA AND COMMUNITY

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INTRODUCTION

Oral histories are widely recognized as a valuable pedagogical resource across disciplines. Educational scholarship has consistently shown that oral histories humanize abstract concepts, foreground lived experience, amplify marginalized voices, and support experiential and reflective learning.¹ In classroom settings, oral histories have been used to promote empathy, deepen contextual understanding, and engage students in critical analysis of history, ethics, leadership, and social change.² Their instructional legitimacy is well established, and their presence in teaching is neither new nor contested. The pedagogical challenge, therefore, is not whether oral histories belong in the classroom, but how they are systematically integrated into course design, particularly through sustained engagement with digital archival collections.³

This case study addresses a pedagogical gap by documenting the intentional integration of The HistoryMakers Digital Archive (THMDA) oral history collection into the design of undergraduate and graduate courses in two distinct educational contexts: Columbia College Chicago and Governors State University. It contributes to teaching and learning and digital pedagogy scholarship by affirming the pedagogical value of oral histories while advancing replicable instructional models that embed archival oral history collections into course design. Drawing on instructional experiences at both institutions, the case further demonstrates how oral history archives can be adapted to support student learning across varied institutional missions, student populations, and course levels. In the context of ongoing public debates in the United States about how Black history is represented and taught, this work takes on added relevance and significance.⁴

IMPORTANCE OF ORAL HISTORY

According to the Oral History Association, oral history's value is in its ability to "place people's experiences within a larger social and historical context, and conversely, to contextualize social and historical events through how people lived them."⁵ For many, oral history is an essential tool, a unique source that fills in some of the gaps left by traditional histories with first-hand accounts from those often left out of the historical record. Voice of Witness (VOW), a non-profit social justice organization that uses oral history to "dismantle systems of oppression," believes in its transformative power to "democratize history and contribute to narrative change."⁶

Oral histories serve as valuable educational tools that enhance students' understanding of historical context, foster empathy, and link theoretical knowledge to real-world experiences.⁷ The essential challenge lies in effectively integrating these resources into course design through the use of digital archives, a challenge emphasized by Boyd and Larson in their examination of oral history and digital humanities collaborations.⁸ Current literature, including work by Shopes, Hamilton, and Avakian, highlights the fact that oral histories are often treated episodically rather than as central elements in pedagogy.⁹ Scholars like Doug Boyd and Mary Larson emphasize the lack of discourse on faculty-archive collaborations in course development and the unrealized potential of sustained partnerships between educators and archival institutions.¹⁰ While fields such as history and writing have successfully utilized oral histories, as documented by Tebeau, Nasstrom, and MacLean,¹¹ disciplines like public administration and policy analysis typically neglect them, focusing instead on technical skills and sidelining human experiences.

This case study centers on the integration of The HistoryMakers Digital Archive (THMDA),¹² the largest digital repository documenting the Black experience in the United States. By preserving and providing access to oral histories of African Americans who have made significant contributions to American life, history, and culture across the nineteenth, twentieth, and twenty-first centuries, THMDA addresses longstanding gaps in the documentation of the African American historical record and offers a uniquely valuable resource for teaching, research, and critical inquiry.

COLLEGE AND COURSE BACKGROUNDS

This case study takes place across two distinct higher education contexts: Columbia College Chicago and Governors State University. Columbia College Chicago is an urban institution of higher education whose students reflect the city and country's economic, racial, cultural, and educational diversity. It offers educational opportunities in close relationship to a vital urban reality and serves an important civic purpose by active engagement in the life and culture of the city of Chicago. According to the College's fall 2025 census, 66% of new, first year students identify as BIPOC, and 62% of first year students are first generation.¹³ Governors State University (GovState) is a public regional university located 30 miles south of Chicago, serving predominantly students of color, with significant representation of Black/African American, Latinx, and multiracial students, many of whom are first-generation college students.¹⁴ GovState also serves substantial numbers of adult and nontraditional learners who balance graduate study with full-time employment and family responsibilities, reflected in a median graduate student age notably higher than traditional four-year institutions.

Within these institutional settings, THMDA was incorporated into an undergraduate course at Columbia College Chicago and a graduate-level course at Governors State University. The undergraduate course at Columbia College Chicago was a 15-week, urban studies course titled: *Chicago: the Global Metropolis* and was designed to introduce new first year students to Chicago's economic, ethnic, racial, cultural, and political development. It was a large class of 50 students; the students reflected the racial/ethnic breakdown of all new first-year students at the college as cited above. The course learning outcomes included developing an understanding of the city of Chicago as a site of inquiry and exploration, identifying analytical frameworks for interpreting the urban context and surrounding communities, and engaging directly with the city through experiential activities accompanied by structured reflection with peers.

At Governors State University, the archive was embedded throughout a graduate-level research methods course in public administration, delivered over 15 weeks during Fall 2025, enrolling primarily in-service professionals from public administration, nonprofit management, healthcare, education, and community organizations. Course learning outcomes focus on students' ability to

identify and define researchable public problems; develop research questions and evaluation objectives; design appropriate qualitative, quantitative, or mixed-method approaches; analyze and interpret data; and communicate effectively to inform public decision-making. Oral histories from the archive were used to connect research methods concepts to real-world policy contexts, support case-based learning, and help students ground research design decisions in the experiences of individuals and communities historically affected by public policy.

The integration of THMDA supported several shared learning outcomes across both courses. Students developed skills in (1) conducting purposeful database searches and (2) strengthening primary source literacy by engaging with oral histories as legitimate forms of evidence. The archive also enabled students to (3) contextualize individual narratives within broader historical, social, and policy frameworks, fostering (4) critical examination of dominant, white-centered historical narratives.¹⁵ Collectively, these activities promoted (5) critical thinking and (6) deeper community connection by linking course concepts to lived experiences reflected in the archive.

INTEGRATION OF THE HISTORYMAKERS DIGITAL ARCHIVE IN THE CURRICULUM

The HistoryMakers Digital Archive (THMDA) was embedded across the entire semester through a scaffolded sequence of individual, and group activities in class and at home, such as discussions, applied exercises, group case analyses, and a final project. Early assignments focused on familiarization and personal connection, while later activities required increasingly sophisticated analytical engagement.

Preparatory Work

Effective integration of THMDA into teaching required intentional instructor preparation prior to classroom use. Across both institutional contexts examined in this case, the preparatory workflow was largely the same, despite differences in course level, student population, and disciplinary focus.

The preparatory process began with familiarization with the archive's structure and search functionality, including thematic categories, occupational filters, and keyword-based searches. Prior to the semester, both instructors conducted targeted searches of oral history content aligned with core course topics and clearly illustrated relevance of lived experiences to course learning objectives.

The instructors then engaged in systematic pre-selection and curation of oral history clips for specific pedagogical purposes across both courses. For example, in the undergraduate course, curated clips, or "playlists" were chosen to connect students with the city and their college through notable alumni, nationally and internationally known artists based in Chicago, and Chicago trailblazers in music and entertainment. These curated playlists were also intended to model what makes a compelling "clip." At the graduate level in the course on research methods, the clips were used to introduce weekly topics, anchor in-class case analyses, and model how narrative evidence can inform problem definition, stakeholder analysis, and research or evaluation design. Each clip was reviewed in full to ensure thematic clarity, instructional relevance, and appropriateness for the intended academic level.

Next, curated clips were explicitly aligned with learning objectives and instructional activities. In the undergraduate class, narratives related to migration to Chicago confirming some of the historical information students would have been exposed to in high school social studies, but they also demonstrated how different each experience was and forcing them to challenge reductionist stereotypes they may have inherited. In the graduate course, narratives related to housing or education policy were paired with stakeholder-mapping and case analysis exercises, while clips addressing unethical research practices were integrated into discussions of professional ethics and social justice research. This alignment ensured that oral histories functioned as analytical material rather than illustrative supplements.

To support implementation, the instructors developed structured discussion prompts and case analysis frameworks tied directly to the selected clips. Over the semester, students were gradually introduced to independent archive use, building on instructor-curated examples, and progressing toward self-directed search and analysis.

Teaching Practices

In the opening weeks, students from both courses completed an in-class activity titled Finding Yourself in the Archives, during which they learned to navigate THMDA and identify a HistoryMaker whose story resonated with their professional or personal experiences. This initial activity served two purposes: it reduced technological barriers to using a digital archive and reframed oral histories as legitimate sources of insight for public service research. Subsequent discussion posts required students to connect THMDA clips to a particular issue discussed in the class. For example, in the undergraduate course, students were asked to choose three key search terms: one related to their major, one related to an interest they had, and one emotion to foster a personal connection to the stories and experiences of someone they do not know and, possibly, of a different race. With each search, they had to identify clips that showed either a challenge, a success, or a piece of advice. In subsequent discussions, online and in-person, students shared what they were surprised by and something they learned.

As the semester progressed, students moved from topic searches, often across interviews, to find stories that spoke to them and their experiences, to considering the life story of an individual, to demonstrate our connections as human-to-human. At first, they were provided with a playlist created from one interview containing clips noting several “typical” turning points in a life (e.g. graduating from high school, college, first job, marriage). After reviewing these stories, students were asked to listen to the entire interview and identify what they considered to be the most important events in this individual’s life and curate their own playlist. In subsequent discussions, the students were asked to explain the difference between the two lists and then compare their curated lists with their peers’ curated list. As intended by the design of the assignment, the deep dive into one lived experience resonated with students who could articulate the reasoning behind their clip choices as they talked about the forces and events that shaped this individual’s life and how they personally connected to it.

The final undergraduate assignment/experience asked students to use a HistoryMaker interview to enhance their understanding of art in the form of an art exhibit. Serendipitously, a major art exhibit of a HistoryMaker (now deceased) was on view at the Art Institute of Chicago during the fall 2025 semester. For this “experience”, students were asked to listen to the first half of the HistoryMaker’s interview to learn about the artist’s early artistic influences and to outline the artist’s journey to becoming an artist of significant renown. Then they were asked to go to the Art Institute to view the exhibit and consider how the interview informed their experience—where did they find evidence of what the artist talked about in the exhibit? Finally, they were asked to listen to the remaining interview tapes and discuss what the artist’s work meant to them. The intent of this assignment was for students to consider not only the importance of oral history to the historical record and black history but to also see it as a tool to find information and pursue knowledge not available in other sources. By allowing students a significant amount of time, in and out of class, to dwell with and consider the life of an artist, one they had never heard of before, through the artist’s own words and art, they were able to confidently discuss, with supporting evidence, how they felt—about the artist, the art, and their own experience.

In the graduate course, students were asked to select oral history clips that illustrated a social or community issue they wished to study and to analyze how lived experience shaped the articulation of that problem. As the course progressed, THMDA became a central resource for applied

methodological exercises. In multiple short case studies, students analyzed curated clips tied to topics such as housing policy, leadership, evaluation design, and professional ethics. In group case analyses, students mapped stakeholder dynamics and power relationships by comparing patterns across multiple oral histories. This comparative approach encouraged students to identify recurring themes, contradictions, and structural constraints—key skills in qualitative analysis and program evaluation.

THMDA also functioned as a practice site for qualitative research methods. In a two-part qualitative analysis assignment, students designed a search and sampling strategy within the archive, documented their selection criteria, and conducted thematic analysis across multiple HistoryMakers' narratives. This exercise emphasized transparency, replicability, and reflexivity—habits essential to rigorous qualitative research.

By treating the archive as a bounded population and requiring students to articulate their sampling logic, the assignment mirrored real-world qualitative research processes. Students learned that qualitative rigor lies not in generalizability, but in systematic reasoning, ethical awareness, and interpretive accountability.

The semester culminated in a research proposal paper in which students were required to integrate THMDA into at least one core component of their design: problem definition, literature framing, hypothesis development, or methodology. Students also incorporated direct quotations from HistoryMakers into their final presentations, reinforcing the idea that narrative evidence can inform both scholarly reasoning and professional communication.

Pedagogical Impact

Over the course of a single semester, we were pleased with the level of student engagement with the THMDA and will continue to use it as a research tool and important historical source. Across undergraduate and graduate contexts, THMDA provided sustained opportunities for students to engage with lived experience as legitimate qualitative evidence, strengthening the connection between methodological concepts and real-world public and community settings.

In their final course reflections, students indicate that working with oral histories reshaped how they understood the course learning materials. In the graduate research methods course, students noted that the use of the archival collections moved them away from viewing research as a purely technical exercise toward seeing it as a human-centered and ethically grounded practice. They also reported that analyzing oral histories enhanced their ability to define public problems, identify stakeholders, and consider ethical implications in research design, directly supporting course objectives related to qualitative inquiry and social justice research.

Engagement with full-length narratives also strengthened primary source literacy and contextual analysis, as students were required to interpret individual accounts within broader historical, social, and policy frameworks rather than rely on decontextualized excerpts.

The integration of THMDA further supported critical examination of dominant, white-centered historical narratives by centering African American voices and experiences that are often marginalized in traditional research materials. Students consistently noted that exposure to these narratives deepened their critical thinking and reinforced the importance of centering community perspectives in public administration and nonprofit practice.

Many in the graduate class also emphasized that the archive enhanced their sense of professional relevance and community connection, particularly by illustrating how leadership, advocacy, and policy decisions affect real people over time. Graduate course evaluation data reinforces these qualitative findings. Students in the graduate course rated the course as intellectually stimulating and relevant, with unanimous agreement that instructional methods supported learning and engagement.

These findings suggest that the pedagogical value of THMDA is not dependent on discipline or course level, but on intentional instructional design that aligns archival content with learning objectives, structured analytical prompts, and scaffolded assignments. Instructors can replicate this approach by investing in upfront preparation, curating oral history clips to model analytic use, and gradually transitioning students from guided exploration to independent inquiry. Importantly, the case underscores the role of oral history archives in supporting equity-centered and community-engaged pedagogy, particularly in programs that prepare students for public service, nonprofit leadership, and applied research.

Although this work was limited to two courses situated at different institutions, an undergraduate urban studies course for entering students and a graduate-level public policy course, the findings also demonstrate that it is possible to design substantive, analytically rigorous assignments appropriate for both academic levels. The flexibility of THMDA supported meaningful engagement among students at different stages of their academic development, from those newly entering higher education to in-service graduate students. The archive also proved valuable for students across racial and cultural backgrounds. Students who identified as BIPOC emphasized the importance of engaging with course materials grounded in African American experiences, while students who identified as white reported exposure to perspectives not typically centered in their prior coursework, contributing to increased awareness of racialized histories and institutional dynamics.

CONCLUSION

This paper offers practical guidance for instructors seeking to integrate digital oral history archives into their curricula. By intentionally embedding The HistoryMakers Digital Archive into undergraduate and graduate teaching across two distinct institutional contexts, this case study demonstrates how digital oral history archives can function as core pedagogical resources that strengthen methodological understanding, critical thinking, and community connection. Student reflections and course evaluation data indicate that sustained engagement with archival oral histories helped students reconceptualize evidence, center lived experience and connect research methods to real-world public and community contexts. Collectively, these findings contribute to teaching and learning and digital pedagogy scholarship by advancing replicable, archive-centered instructional models that support equity-informed, experiential learning across higher education.

This study is not without limitations. First, the evidence presented relies primarily on student reflections and course evaluation data, which capture perceived learning and engagement rather than direct causal measures of learning outcomes.¹⁶ Second, the courses examined were taught by a single instructor with prior experience using THMDA and access to professional development opportunities, which may limit generalizability to instructors without similar preparation. Finally, the small class sizes, particularly in the graduate course, may have facilitated deeper discussion and individualized support that could be more difficult to replicate in larger instructional settings. Future research could address these limitations by examining THMDA integration across multiple instructors, institutions, and class sizes, and by incorporating additional measures of student learning outcomes.

NOTES

¹ Doug Boyd and Mary A. Larson, "Oral History and Digital Humanities: Voice, Access, and Engagement," in *Oral History and Digital Humanities: Voice, Access, and Engagement*, ed. Doug Boyd and Mary A. Larson (New York: Palgrave Macmillan, 2014), 1-20.

² Arlene Voski Avakian, "Oral History and Teaching," in *The Oxford Handbook of Oral History*, ed. Donald A. Ritchie (Oxford: Oxford University Press, 2011), 162-177; Alessandro Portelli, "What Makes Oral History Different," in *The Oral History Reader*, 3rd ed., ed. Robert Perks and Alistair Thomson (London: Routledge, 2016), 48-58.

³ Doug Boyd and Mary A. Larson, "Oral History and Digital Humanities: Voice, Access, and Engagement," in *Oral History and Digital Humanities: Voice, Access, and Engagement*, ed. Doug Boyd and Mary A. Larson (New York: Palgrave Macmillan, 2014), 1-20.

⁴ Sandhya Dirks, "Scholars Say Trump Administration Is Trying to Erase America's Non-White History," *NPR*, March 29, 2025, <https://www.npr.org/2025/03/29/nx-s1-5333846/scholars-say-trump-administration-is-trying-to-erase-americas-non-white-history>; <https://www.nytimes.com/2026/01/23/climate/national-park-service-deleting-american-history-slavery.html?smid=url-share>; <https://www.nytimes.com/2026/01/22/us/politics/park-service-philadelphia-slavery-exhibit.html?smid=url-share>; <https://www.nytimes.com/2025/08/19/us/politics/trump-smithsonian-slavery.html?smid=url-share>; <https://www.nytimes.com/2025/05/06/us/politics/trump-censorship-black-history.html?smid=url-share>;

⁵ <https://oralhistory.org/about/do-oral-history/>

⁶ <https://voiceofwitness.org/about/>

⁷ Arlene Voski Avakian, "Oral History and Teaching," in *The Oxford Handbook of Oral History*, ed. Donald A. Ritchie (Oxford: Oxford University Press, 2011), 162-177; Alessandro Portelli, "What Makes Oral History Different," in *The Oral History Reader*, 3rd ed., ed. Robert Perks and Alistair Thomson (London: Routledge, 2016), 48-58.

⁸ Doug Boyd and Mary A. Larson, "Oral History and Digital Humanities: Voice, Access, and Engagement," in *Oral History and Digital Humanities: Voice, Access, and Engagement*, ed. Doug Boyd and Mary A. Larson (New York: Palgrave Macmillan, 2014), 1-20.

⁹ Linda Shopes, "Making Sense of Oral History," *History Matters: The U.S. Survey Course on the Web*, February 2002, <http://historymatters.gmu.edu/mse/oral/>; Paula Hamilton and Linda Shopes, eds., *Oral History and Public Memories* (Philadelphia: Temple University Press, 2008); Avakian, "Oral History and Teaching," 162-177.

¹⁰ Boyd and Larson, "Oral History and Digital Humanities," 1-20; Mary A. Larson, "Potential, Potential, Potential: The Great Collaboration Between Oral History and Digital Humanities," in *Oral History and Digital Humanities: Voice, Access, and Engagement*, ed. Doug Boyd and Mary A. Larson (New York: Palgrave Macmillan, 2014), 187-202.

¹¹ Mark Tebeau, "Listening to the City: Oral History and Place in the Digital Era," *The Oral History Review* 40, no. 1 (2013): 25-35; Kathryn L. Nasstrom, "Between Memory and History: Autobiographies of the Civil Rights Movement and the Writing of Civil Rights History," *The Journal of Southern History* 74, no. 2 (2008): 325-364; Nancy MacLean, "Getting the Story Straight: Oral Histories, Written Documents, and the Revival of Labor History," in *The Oxford Handbook of Oral History*, ed. Donald A. Ritchie (Oxford: Oxford University Press, 2011), 251-264.

¹² <https://www.thehistorymakers.org/>; THMDA is a subscription based organization with over 150 member institutions of higher education; limited access is available to non-subscribers.

¹³ Fall 2025 Census

¹⁴ <https://www.govst.edu/viewbooks/>

¹⁵ This can be particularly important for entering freshman students. See: James P. Kelly and Roger C. Aden, "Perpetuating the Past: U.S. High School History Textbooks and Systemic Racism," *Journal of Applied Communication Research* 50, no. 3 (2022): 236-252.

¹⁶ Not surprisingly, in the undergraduate course there were some disgruntle students. In their student evaluations, a couple of students questioned the amount of time devoted to the African American experience, and one student felt a person of color should be teaching the class.

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ETHICAL AI TOOLS AND CRITICAL THINKING: DESIGN EDUCATION CASE STUDIES

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INTRODUCTION

Artificial Intelligence (AI) and the possible applications of this technology are being described as revolutionary and disruptive to society and industry.¹ Creative Practice industries are already seeing widespread adoption of these applications with a myriad of generative programs and platforms rapidly becoming available. Generative AI (genAI) tools offer designers the capability to rapidly conceptualize, create and manipulate visual outcomes and tell narratives.²

While the marketing of AI as reaching human (or superhuman level) intelligence is doubtful under the current technology of LLM's, the deluge of media hype around AI and the replacement of human jobs with AI controlled systems is creating a torrent of anxiety about the future of work and human endeavour.³ What will or could be the outcomes of such a technology and its potential widespread application? What is its current usefulness now or in the next 5 years? Teachers and students should be examining not just the future of work but changes to the ways we live, shop, communicate, bank, entertain ourselves and travel, as we function in an increasing automated and AI enabled society.⁴

Designers are early adopters, deeply interested in social and technological paradigm shifts and invested in their role to positively influence changes to human behavior with the introduction of new products and services.⁵ Graduates enter the workforce employed to develop technological or social responses to the Zeitgeist. In design education, these trends inform the development of the syllabus—both critiquing the hype whilst being mindful of engaging students in learning new skills and technologies that may become the required capabilities for entry level jobs.

Generative AI tools present critical challenges to navigating the future of design education and practice.⁶ While the tools enable the rapid generation of compelling content, they also call for what we argue are new forms of digital agency grounded in criticality, discernment, situational awareness, experimentation, and resistance to platform dependency. These technologies, like other major disruptors before them such as desktop publishing from the 1980's onwards⁷ and the integration of digital technologies such as computer-aided design (CAD) into workflows in the early 2000s, will have a profound effect on creative industries. Design educators and students must develop core literacy with these tools, and understand how to locate them professionally, or risk being left behind. As design educators we argue for the need to emphasise the critical and ethical implications of AI such as resource extraction, bad data, privacy, biases, intellectual property, and the slow implementation of legislative guardrails.⁸

This paper from Australian design academics presents 3 case studies of teaching genAI tools to students with a critical awareness. These practice-based examples of teaching and learning demonstrate how genAI platforms can be woven critically into design education to support collaboration, ideation and design development and how students can be guided to co-create with AI while interrogating its social and cultural impacts on the world we live in.

DESIGN PEDAGOGY

Design syllabuses can be loosely grouped into studio models and electives. Technical electives are smaller courses where specific technologies, or design methods are taught. Another type of elective which runs alongside these technical courses introduces students to the epistemologies of their discipline and encourage a focus on history, theory and critical thinking about people, place, society and our effect on it. Reflective, critical and contextual awareness is what we want students to develop. The studio model at RMIT university is based on a course structure which allows for both technical skill development and the critiquing of problems and contexts. This model allows for a more expansive and nuanced response to briefs where the students projects are grounded in high quality research methods through a critical lens or methodology, whilst also evidencing that students have developed specific skills. These skills can involve the generation of sophisticated visual materials for presentations, concept development and the building of detailed physical or virtual models and technical prototypes using CAD technologies.

In our case studies we present examples of two technical electives and one studio. We argue that AI even taught discreetly as a set of tools in technical electives must be taught in such a way that students develop a critical and contextual awareness of how they are using the technology and how it is being used on them.

The design process begins with a ‘fuzzy front-end’⁹ which is the research, investigation, problem defining and concept development stage. It is where an individual or team will take a problem, interrogate it, and find information that either helps people understand the problem or proposes a better solution. It is an iterative process of analysing that information, developing concepts and interrogating the validity of those ideas critically and creatively. It is obvious how AI might be useful in generating visual outcomes, but what is the value or hinderance in the fuzzy front-end where a good proposal gets generated (or not) and the beginnings of suitable and helpful concepts get formed? How do designer students learn to practice discernment at this stage of the design process? The aim of these courses was to explore, document and analyse how GenAI platforms (like Firefly, Mid Journey, and Chat GPT) can be introduced as new design tools and critically woven into design education to support collaboration, ideation and design development with students developing and exercising strong critical awareness. Students were encouraged to see these tools not as a short-cut to developing a good project but as a new type of collaborative partner that becomes part of the discursive team environment and iterative workflows.

All courses were framed within sustainability, regenerative design, climate change adaptation or more-than-human discourses. Two key design methods introduced via exercises and briefs in these contexts were Speculative Futures scenario’s and world building.¹⁰ Speculative Futures is a methodology that asks designers to move away from what is known and envision new types of realities or futures. The design equivalent of literary or cinematic fiction. It suits the development of students’ conceptual skills, and unshackles them to imagine wildly and widely, before concepts are re-grounded in probable or possible future realities based on good quality research.

Case Study 1: Algomaterial Interior Design technical elective

Algomaterialities was an undergraduate Interior Design course that ran for three hours a week across twelve weeks taught by design academic Kate Geck. This course sits in a stream which introduces students to different ways of practicing interior design, emphasizing the integration of skills and materials into contexts. The brief required students to imagine a future where humans and more-than-human others such as plants, fungi, animals or AI could co-exist and what would those spaces or places look like?¹¹

The course was structured into three distinct but progressive modules or stages: *Generative AI*, *Design Futures*, and *Propositional Practices*. Students learned AI tools while exploring speculative futuring ideas through exercises such as card decks, scenario building and speculative timelines. The assessments and class activities encouraged students to develop technical fluency with AI platforms, collaboration skills amongst themselves and a foundation in AI tools, and critical thinking about the value and biases of the processes they were experiencing within the LLM's.¹²

In the first phase of introducing the AI tools, Geck created tutorials on genAI platforms in which students experimented with text-to-image platforms such as Adobe Firefly or Midjourney, and text-generation platforms such as Chat GTP. The aim was to teach students to develop flexible workflows that shifted between different text and image generating platforms depending on need or the specific features of a tool, this gave the students the experience of working interchangeably with the platforms as an active not passive exercise that required critical and creative thinking.

In the next phase Design Futures, students worked in small groups engaging in a range of activities and exercises that prompted them to speculate on possible futures across timelines of 25 to 100 years. They collaborated with ChatGPT on what these scenarios might be and used Adobe Firefly to create visual collages of multi-species and more-than-human speculations.

In the last phase Propositional Practices, the students proposed themselves as a speculative design agency located at some point in the future envisioning outcomes for multi-species living. In pairs the students developed a final project using design narrative as the central communication tool through genAI platform visuals, developed from an iterative process of class discussions and prompting trials. Groups created a manifesto for their agencies addressing the values leading their designs and design decisions.

Teacher Kate Geck came to three important conclusions she discusses as **Practices of translation**, **AI × design literacy** and **Critical thinking**. In the first **Practices of translation**, she notes that GenAI outputs were treated as conceptual materials, not as 'renders' or finished designs. Works in progress to be translated through editing and iteration, into a context that students dictated through their own agency by applying creativity and critical thinking (**AI × design literacy**). That digital literacy is not just tool proficiency but critical awareness, contextual framing and an understanding of where to situate AI processes within a larger design process. **Critical thinking** was also explored and developed through class exercises and group discussions reflecting on the types of biases and images generated using specific words. Students were able to see that the tools weren't perfect, and this required constant reflection, reasoning and a questioning of their values.



Figure 1. Jacky Zhu and Yudi Huang, “Evolve It” A speculative agency using ad-hoc materials to produce survival + remediation wearables for a hostile planet. (2024)

CASE STUDY 2: DESIGNING WITH DATA TECHNICAL ELECTIVE FOR MASTER OF DESIGN, INNOVATION AND TECHNOLOGY

Using AI tools in the Designing with Data course expanded the subject's remit of teaching students to analyse data sets, employ data journalism and storytelling skills within specific design contexts and problems. Students explored the relationship between design processes and the use of data to understand a problem, creatively and clearly telling stories from complex data sets. The course was grounded in developing an understanding of the ethical issues of data gathering analysis and interpretation. Developing the student's data literacy and ability to critique the origins and accuracy of the information they were engaging with for research. This grounding in critical awareness and ethics then flowed into the use of genAI tools.

While the technical challenges of the course involved teaching students data visualisations / physicalisation skills, AI platforms and tools, the brief was situated within a regenerative design context. The overarching challenge was to research and document the plight of an endangered animal or plant or eco-system through data. Students then speculated on how future adaptations and transformations might encourage more-than-human flourishing in a world changing through climate change, while demonstrating AI tool manipulation and mastery through visual and conceptual outputs. The MDIT cohort is a mix of students from a diverse range of Bachelor study backgrounds. While some designers, others come from engineering, UX/UI, computer science, or business degrees and professional backgrounds. Tasks that an Industrial Design graduate may find reasonably easy cognitively such as generating concepts from information and then translating those concepts into physical objects, non-cognate designers may find initially challenging. Design requiring the communication of ideas through different modalities and outputs such as ideas into text, 2d visual, 3d physical or 3d virtual. Designing with data asking students to interrogate how a problem unearthed through a data set can become communicated meaningfully and solutions proposed through visualisations and physical objects.

Teacher Emma Luke develop a brief that used the concept of Design Metaphors.¹³ Essentially these are visual metaphors that encapsulate or communicate core messages or ideas about the project.¹⁴ This is an important cognitive and creative skill for designers to develop, Luke observed that students can find this mental exercise challenging at first. While teaching students to use various AI platforms and

tools the key objective was to develop concepts around metaphorical ideas and critically use AI tools to visualise and analyse outputs in an iterative process. Students were expected to reflect on outcomes and further iterate to get better results. The idea of meaning making through metaphor encourages the development of conceptual sophistication grounded in material culture. Requiring students to explore semiotics in the construction their AI prompts. The exercise was positioned as playful exploration, AI tool used to generate many ideas which then had to be critically appraised. Students developed a collaborative relationship with the AI tools without the responses dominating the project results.



Figure 2. Harishita Prakash, Jisu Lee, Pulina Restrepo. 'White Sea, Coral Bleaching'. (2024)

CASE STUDY 3: ETHICAL AI FUTURES LAB DESIGN STUDIO FOR MASTER OF DESIGN, INNOVATION AND TECHNOLOGY

This studio was a 6 hour a week course over 12 weeks divided into 2 x 3-hour classes. It aligned with the UN's AI for Good Summit. In the first 6 weeks students spent one class on theory, ethics and context, and the other class on learning genAI methods with critical awareness. The studio was framed within the domains of sustainability, social innovation and digital transformation. Design studios devote generous amounts of time to the bringing together of skills, technique and critique. Students are expected to display a reasonable level of mastery in conceptual development documentation of their iterative design processes and final polished design outputs.

Students were invited to engage in a series of 2050-oriented future scenarios addressing the United Nations Sustainable Development Goals (SDGs), with a sub theme of exploring the future of work and education. Speculative future AI technologies were positioned as a potential catalyst for equitable, sustainable, and socially responsive futures and students were encouraged to explore designing a world that fostered inclusiveness and regenerative futures.

Teachers Emma Luke and Stephanie Camerena developed the course in response to a perceived need for emerging designers to learn how to engage ethically with AI technologies by developing a critical awareness through the syllabus activities, allowing the students to challenge their own anxieties about the epistemic ambiguity of using these emerging tools.¹⁵

An important part of the studio were discussions on the MIT Media Lab study *Your Brain on ChatGPT: Accumulation of Cognitive Debt*, released June 2025.¹⁶ Students became aware of the cognitive deficit effect created from relying too much on the use of AI tools. The more you use AI to do your critical and creative thinking, the weaker and less active your neural pathways become.¹⁷ As you use AI more to do these metacognitive tasks the weaker you become in doing these activities

unaided. The students were encouraged to think independently of AI tools and self-regulate their learning (SRL).¹⁸ SRL refers to the development of the three key learning processes of: metacognition, motivation, and strategic action.¹⁹ Students were encouraged to use AI tools to extend, develop and visualise their ideas but not replace them nor the mental tasks of using their own creative cognitive abilities.

Like the previous 2 case studies, no one platform provided all the tools and features to create the outputs needed. The lecturers observed and encouraged students to develop iterative and flexible platform switching workflows. Moving interchangeably from text to image generation and back again to refine and achieve the best results. This process enables the students to learn and discover the attributes of different platforms but use their own reasoning, creativity and metacognition. They had to be reflective and critically aware of what they were asking the tools to do and the limitations. Far from AI being a quick fix, the tools became a set of technologies as part of an iterative and reflective design process, in which the designer becomes a *Bricoleur* of information and outputs.²⁰

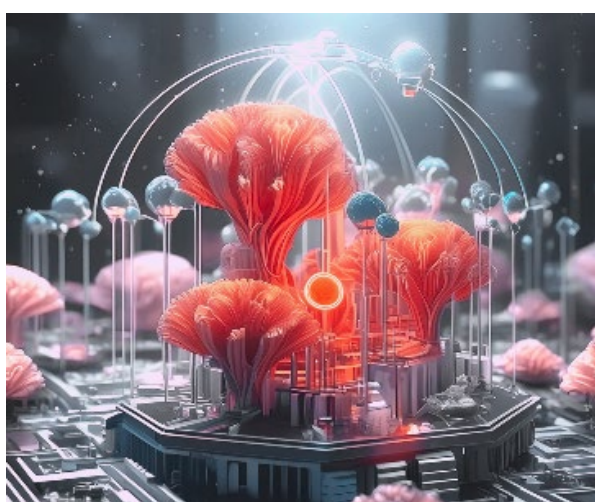


Figure 3. Jisu Lee, Harishita Prakash, Paulina Restrepo 'Coral Resilience: Envisioning a Multispecies Future' (2024)

CONCLUSIONS

The highly emergent and rapidly evolving nature of genAI tools bring with them a set of vastly different challenges compared to the other technological platforms designers have learnt to use in the last 40 years. There are many local and broader challenges to students and society. The possibility that we lose or cede control of our agency within design projects to AI, and in the process potentially experience decline in our creative and cognition skills (or employment) should not, we argue be the aim of any AI learning and teaching. Through teaching technical specialisations grounded in critical thinking and contextual awareness teachers can embed a strong sense of agency in students. Empowering them to be discerning in their use of AI tools and aware of the way those tools are also being used on them. We felt it necessary to approach this new technological space from an understanding of our own values as teachers and what we wanted students to walk away with from these courses.²¹ Below are the key observations and findings.

AI tools are not a short cut to a good design process when exercises are done in a collaborative and iterative environment requiring discussion, interpretation and critical thinking AI becomes just another tool (or collaborative partner) in a normal design process.

However, **teachers must embed the theoretical and ethical foundations** into exercises, briefs and discussions early. Design students need to understand AI's bias, limitations and constraints. Without this, students risk becoming passive consumers of shallow superficial outputs.

Teachers must frame and lead students through relevant exercises. **Choice overload and creative paralysis are common challenges** for students. Teachers need to scaffold class exercises and briefs, so students are not overwhelmed by the endless possibilities.

In using AI tools, the **role of the designer is changing to be both a Bricoleur and Curator** as well as creator of information and iterative outputs. Students must develop flexible and agile workflows between platforms. Students need to discern, filter, and commit to the most relevant and appropriate design directions and avoid being seduced by the overwhelming aesthetic noise of the tools.

All the case study discussed have a common pedagogical intent of encouraging students to be critical of AI and the way they are using it. The briefs and exercises in these courses were developed so students could experience learning in a discursive, collaborative and iterative environment—common design skills and tactics. Gen AI has brought with it a racially new and exciting but currently unstable technical environment that has both productive, yet biased and unpredictable results. This requires teachers to juggle imparting technical skills, theoretical knowledge, and critical thinking. A sense of agency should be encouraged in students to become agents of change in designing the world they want.

NOTES

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- ³ Emily M. Bender and Alex Hanna, *The AI Con: How to Fight Big Tech's Hype and Create the Future We Want* (2025).
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- ¹⁹ Brenner, "Self-Regulated Learning, Self-Determination Theory and Teacher Candidates' Development of Competency-Based Teaching Practices"; Winne and Hadwin, "Studying as Self-Regulated Learning"; Barry J. Zimmerman and Dale H. Schunk, "Motivation: An Essential Dimension of Self-Regulated Learning," in *Motivation and Self-Regulated Learning: Theory, Research, and Applications*. (Lawrence Erlbaum Associates Publishers, 2008).
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HUMANIZING THE MACHINE: EMBODIED AND EXPERIENTIAL LEARNING STRATEGIES FOR TEACHING SOFTWARE AND COMPUTATIONAL SUBJECTS

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INTRODUCTION

The rapid expansion of computational disciplines within creative arts education has created two persistent pedagogical challenges: how to teach abstract, symbolic concepts to students whose prior learning might have emphasized materiality and visibility? And how to adapt the pedagogic knowledge and expertise of the institution to disciplines of a wholly novel type? Norwich University of the Arts, with its 180-year tradition of studio-based pedagogy, exemplifies this tension. While the institution has successfully integrated digital courses over the last twenty years, such as computerized animation and textile design, or videogame design, subjects which require the teaching of coding and algorithmic reasoning remain difficult. The introduction of a sandwich year at Level 5 which students from any undergraduate course are able to take has exploded the possibilities for digital creativity within all our disciplines. But it has also highlighted tensions as learners with little or no coding skills enter a year of algorithmic thinking. As Medeiros et al. note, students in general often struggle with “the ability to abstract and generalize” and with “turning a textual problem into a mathematical formula”.¹ Concepts such as variables, data types, and memory addresses resist intuitive mapping to real-world objects, creating cognitive barriers which can hold back effective learning. The student programmer “cannot rely only on repetition and memorization. It is necessary to have understanding, problem solving skills, to talk with others”.²

Conventional strategies such as problem-based learning, live coding, or gamification offer partial solutions but “are still not commonly adopted in higher education.”³ Norwich’s Creative Learning Strategy foregrounds a whole student approach and playful “embodied knowledge,”⁴ prompting experimentation with pedagogies that mobilize the body and environment as cognitive resources. This approach is drawn from in-depth consultation with academic staff who are almost universally oriented towards embodied and material thinking irrespective of their disciplines, a philosophy based in post-Bauhaus approaches which is all but hegemonic across Western art and design education. The three case studies discussed below synthesize these innovations with established theory to argue that embodied and experiential learning can transform computational education, especially the understanding of abstract concepts. We also consider implications for inclusivity, particularly for neurodivergent learners.

THEORETICAL FRAMEWORK

Active Learning and Its Challenges

Active learning is widely endorsed in higher education, yet its implementation in computational subjects is fraught with challenges. Some recent studies show that students can feel tense when asked to participate, both by the fact that a lecturer is directly asking them to speak, having to speak in front of the whole class, as well as worrying that they cannot answer a question correctly.⁵ If we also consider the after-effects of the COVID-19 pandemic, after which social anxiety disorder peaked generally and more so in students, it becomes apparent that asking student participation without appropriate scaffolding can be dangerous within today's higher education climate. On top of that, the social nature of active learning has “the potential to increase students’ reported anxiety if they fear that others will negatively evaluate them”.⁶ This can create a negative cycle in which the student becomes more and more reluctant to participate.

Those students who are more at risk of entering the negative cycle of learning are students with social anxiety and, at the same time, students who have a neurodivergence are more prone to develop social anxiety.

Wlodkowski and Ginsberg’s 1995 framework for culturally responsive teaching offers a lens for designing active learning activities that mitigates these risks.⁷ Although Ginsberg and Wlodkowski’s study focused on cultural diversity, their ideas seem relevant to other forms of diversity, as the framework establishes rules to involve students who may be reluctant to participate in class generally. The study proposes that the key points to involving these students are **Establishing Inclusion, Developing a Positive Attitude, Enhancing Meaning, and Engendering Competence**. Each element within the framework has a series of associated norms, which define how it should be reached.

Experiential Learning

Kolb’s experiential learning cycle (concrete experience, reflective observation, abstract conceptualization, active experimentation) provides the implicit framework for day-to-day teaching within creative disciplines.⁸ Students typically develop projects through successive cycles of iteration and experiment, responding to materials and feedback from the course community. Papert’s constructionism similarly emphasizes learning through making, arguing that programming environments should enable learners to think with objects.⁹ Project-based learning operationalizes these principles by situating knowledge within authentic tasks.¹⁰ When combined with scaffolding and collaborative structures, experiential approaches can accelerate mastery of threshold concepts, those transformative ideas that, once understood, open new disciplinary vistas.¹¹

Embodied Learning

Embodied cognition posits that thought is grounded in sensorimotor experience and has gained prominence in discourses of creative education in the last twenty years in relation to tacit knowledge, and concepts such as Schon’s reflection-in-action.¹² Learning is not merely symbolic but enacted through bodily engagement with the environment. It is easy to see how this might apply to subjects such as acting and dance, or even perhaps hand-based skills like ceramics. In computational education, this perspective challenges the dominance of screen-based instruction by advocating for physical modeling of abstract structures. Research in STEM education supports embodied strategies for teaching complex systems,¹³ yet their application to creative coding and software training remains underexplored.¹⁴

CASE STUDIES

1. Sprinting to Success: Project-Based Learning in the Banking Hall

This project operationalized experiential learning at scale, creating excitement through the use of non-standard learning spaces and facilitating access to the university's world-leading research facilities. Guided by the University's Creative Learning Strategy, every course is committed to running a non-curriculum group project, working across years and often adjacent courses, for 1 week every academic year. Projects are typically located in our Bank Plain building, a huge Victorian-era hall which offers the opportunity to configure working spaces in temporary and exciting arrangements. At the time of planning this project, the University had also recently developed an Immersive Visualisation and Simulation Lab (IVSL), with funding from the AHRC. An exciting component of the IVSL is a 10-metre diameter, 4-metre high 360° video screen which the Creative Computing, Technology and Robotics course team were keen to leverage as part of their project.

The project would use the well-known creative coding platform p5.js, created by new media artist Lauren McCarthy in 2013¹⁵ based closely on the earlier Massachusetts Institute of Technology (MIT) Processing framework intended to 'synthesize graphic design with computer science'.¹⁶ Students already had some experience with this platform.

The project would be interactive through the use of MIDI controllers, with 4 controllers on plinths placed in front of each screen quadrant, thus creating an experience that offers physical agency. A pragmatic technical approach was developed, allowing 4 student groups to each work with a laptop outputting a quadrant of the final 360° outcome.

Inspired by project-based learning pedagogy, particularly as it has been applied to STEM subjects e.g. Papert, and Martinez & Stager, the project would create something of value to the learner that also responds to a real-world problem. In such a short space of time and with an aspiration to create high quality project outcomes appropriate to an internationally visible research facility, it would be prudent to incorporate suitable instructional scaffolding. Additional inspiration was derived from the SCRUM project management approach¹⁷ where a 'sprint' is defined as a short, fixed duration period, during which time a team commits to developing a defined outcome based on prioritised requirements, rather than a specific outcome.

Course staff prepared p5.js templates that demonstrated the loading of 4 sets of environmental data – UK solar panel installation 2010-2025,¹⁸ real time UK river flooding,¹⁹ EU Drought Impact,²⁰ and average global temperature changes since 1880.²¹

Staff and students visited the screen early in the project week to discuss physical implementations and be inspired by existing work. Students were encouraged to research and ideate as a group prior to beginning development, with staff supporting the groups in the exploration and customization of the templates. Subsequently, the 4 LCD screens were arranged in a square to mimic the set-up of the 360 screen. Outcomes were critically appraised by the groups and fine-tuned.

On the final day, staff and students decamped to the 360 screen and installed their work, with additional fine tuning taking place in situ. By 1pm a coding freeze was declared and at 2pm doors opened to colleagues, friends and invited industry professionals.

The creative outcomes demonstrated the success of the project design and execution – the strength of well-scaffolded, well-supported collaborative activity, especially with the incentive of an exciting physical exhibition opportunity. There was a general atmosphere of co-learning, with meaningful co-creation activity that partnered students with both academic and technical staff.

It terms of what might be improved – greater flexibility, e.g., greater student choice of data set, choice of format etc., would be possible if the sprint was held over a longer period. This would align more closely with the original philosophy of Seymour Papert who advocated for greater student choice of project subject as a means to motivate their learning.



Figure 1. Creative Computing, Technology & Robotics project outcomes. Photographs by Andi Sapey, January 2025

2. Find the Duck: Gamified Embodied Coding

In the Find the Duck lecture, students learnt surface-level coding principles by playing with rubber ducks. Year 1 Creative Computing and Robotics students were paired and asked to guide each other towards finding a hidden rubber duck. One student acted as the programmer, knowing where the rubber duck was, and the other as a computer or robot, which had to follow precise instructions to find it. Different iterations of the game were played, in which different rules were introduced to exemplify specific coding principles – for example, in one iteration they had to write all the instructions before “starting” the robot, which meant they had to predict the outcome of their instructions, representing compiled coding. By iterating the game with different rules, students could draw from their prior experiences to predict outcomes and adapt their strategies. Additionally, the playful, hands-on approach encouraged students to explore coding concepts in a low-pressure environment. At the end of the lecture students were gifted the rubber duck they had been working with, thus becoming their new coding companion.

This exercise draws from Active Learning, by getting students into action, and not just presenting coding ideas in a decontextualized manner. The exercise was introduced in a scaffolded manner, by starting with simpler concepts - such as starting with interpreted language, where students could rewrite the instructions as the exercise developed - and moving towards more complex exercises as the lecture advances - such as multithreading, where students had to guide more than one “robot” at the same time.

Furthermore, this lecture was inspired by Wlodkowski and Ginsberg’s framework for a culturally diverse classroom,²² initially geared towards classrooms with cultural diversity. While the original framework was developed in the context of cultural diversity, this particular exercise was developed in a class with high percentage of neurodivergent students as a case study to apply the framework to a different type of diversity. One of the four principles of the framework is to Develop a Positive Attitude towards learning.

With these theories in mind, the lecture aimed to tackle two goals: Firstly, it aimed to make technical concepts more approachable to students who may feel threatened by the technicalities of the language. Secondly, it aimed to promote a positive attitude towards learning among students, by making the learning playful and strengthen horizontal bonds between them.

When the exercises were implemented in class, students that usually seemed quieter seemed to liven up and interact with their peers. Students quickly caught onto the intended playful attitude and

reported feeling closer to their peers after the lecture. The concepts presented did not overwhelm students, who grasped everything that was expected of them in that lecture.

3. Embodying Nodal Logic: Teaching VFX Compositing

Learning Nuke, an industry-standard compositing tool used in VFX to manipulate and combine digital imagery, poses a threshold challenge: its node-based, non-linear architecture contrasts sharply with the layer-based logic of software with which many students are typically familiar. To bridge this gap, students enacted the logic physically.

Nuke uses a node-based interface in which users link different operations into sequences known as scripts. Each node can be connected to many others in a non-linear formation. This basic concept involves a degree of spatial reasoning, following chains of logic and non-linear thinking, sharing more in common with visual scripting than most creative software techniques. This is a threshold concept, key to understanding the basic operation of Nuke.

To explore this, students were organized into teams of seven, and each student was given a card representing a function. Each function was a single alteration that could be combined with other functions to create different effects (“I make everything below me red”; “I make a square”). Students were instructed to arrange themselves and their functions into a single line and a specific order to achieve different effects.

Example task: Create a red square

Order of functions: I make everything below me red > I make a square

Result: A red square

The tasks started simply, involving the combination of only two functions, allowing students to feel comfortable and confident with the concept. The tasks then increased in complexity, requiring the students to combine many different functions in specific orders to achieve the desired result. Once they had constructed their sequence, the instructor would call out their functions in order, starting from the bottom and working up, until announcing the final result.

This continued to a point that the students were given a task that was not possible within the limitations of the current system, A big blurry red circle and a small blurry blue square. Though not seemingly significantly different in complexity to the previous task, there is no way for students to successfully arrange their functions in a single line that would achieve the desired result. At this point it was explained to the students that they have been operating a linear, layer-based system (similar to Photoshop which many of them are familiar with). In this linear, layer-based system all functions on the top effect all functions underneath them, creating a fundamental limitation to the system. So the students were challenged to create a new system that would allow them to achieve the result. They very quickly got hold of the idea that they need to create multiple, branching lines.

Order of functions:

I make everything below me blurry

I make everything below me big

I make everything below me red

I make a circle

I make everything below me small

I make everything below me blue

I make a square

Result: A big blurry red circle and a small blurry blue square

At this point it was explained to the students that they were now using a node-based system, allowing for branches of logic and different combinations of functions. From here we explored different, more complex tasks that were now possible within the altered system, before eventually turning to the software itself, with the new understanding of the possibilities inherent in a node-based system.

This approach was based in the idea of experiential embodied learning that uses physical activity and the body's interaction with the environment to enhance learning. By translating the abstract spatial

reasoning of the software to physical space, the activity embraced haptic, object-based learning, combining touch sensations and kinesthetic movement to give "continuous contact with reality"²³. The workshop was designed to embed the ideas more deeply and allow students to physically perform the logic before encountering it onscreen. Outcomes included faster uptake of Nuke and enhanced collaborative problem-solving.

PEDAGOGIC IMPLICATIONS

These cases demonstrate that embodied and experiential strategies can demystify abstract computational concepts by grounding them in physical and social experience. Embodied modelling externalizes invisible structures, making them manipulable and discussable. Gamification and collaborative sprints harness intrinsic motivation, while robust scaffolding in all examples ensured cognitive load remains manageable. Importantly, these approaches resonate with creative arts students' existing dispositions toward materiality and play.

Active learning's social demands risk marginalizing students with anxiety or neurodivergence. As noted above, the social nature of active learning can increase student anxiety and autistic students often face "the cost of success" in navigating higher education.²⁴ Inclusive design requires anticipatory scaffolding: low-stakes entry points, pair work, and gamified formats that distribute cognitive responsibility. The Find the Duck and Nodal Logic exercises exemplify this by emphasizing collaboration over public performance. Similarly, embodied tasks can support neurodivergent learners by leveraging strengths in spatial reasoning and pattern recognition.²⁵ Multi-modal activities and embodied strategies in general naturally intersect with universal design for learning (UDL) principles to create genuinely accessible computational curricula.

Challenges and Future Directions

While successful, this type of intervention can be resource-intensive. The Banking Hall sprint demanded significant technical preparation and staff coordination; embodied workshops require space and facilitation expertise which may be present within a creative education environment but cannot be taken for granted across Higher Education more generally. Scaling such practices necessitates institutional commitment and faculty development. Moreover, empirical evidence remains limited. Systematic studies comparing embodied and conventional approaches on learning outcomes, retention, and affective measures are needed and would be a logical next step.

Conclusion

Teaching computational subjects in creative education contexts demands pedagogies attuned to the embodied nature of cognition and the experiential basis of understanding. By mobilizing physical activity, collaborative making, and authentic performance, educators can render abstract concepts tangible, foster inclusion, and cultivate resilience in learners navigating challenging threshold concepts. The examples presented here affirm the potential of embodied and experiential strategies to humanize the machine; transforming code from an opaque syntax into a lived, shared practice. As a university, we plan to consolidate these innovations into scalable models, evaluate their impact, and theorize their implications for the evolving landscape of computational literacy in our historic artistic context.

NOTES

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RESEARCH-CREATION IN ACADEMIA: ANIMATING PARA-PEDAGOGICAL ENCOUNTERS THROUGH SKETCH-BOOKING

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INTRA-DUCING¹

Educational art practices are pervaded by dominant discourses telling children both what to express, how to express it, and what is worthy of adults' attention. These discourses are affected by the need to see art through solely representational accounts, and children as still progressing, developing and becoming literate in visual language while excluding the strong presence of more-than-humans and the diverse ways of being child. However, the field of posthuman studies has introduced other perspectives on practicing art that are neither solely exclusive to humans nor solely representational or intentional. They trouble the dominancy of pre-determined outcomes that can serve to diminish children, especially those from minority groups. By refusing to engage in the disabling constraints of formal pedagogical practices, prescribed by the systemic mechanism of institutional bodies, the process of sketch-booking is offered to engage with education research and pedagogy, to reimagining who and what can be valued in education; suggesting how practicing art artfully can trouble and challenge the colonial structure that continue to marginalise and exclude. Therefore, the writing attempts to engage with Erin Manning's notion of 'parapedagogies'² by exemplifying how para-pedagogical practices are created among children and objects, such as dust, engendering learning spaces, which do not necessarily expose themselves directly as teaching and learning environments. To study these spaces requires an attentiveness to their own emergent logics, to their locality, to the precise ways in which their practices are engendered and sustained. The research makes claims that sketch-booking as para-pedagogies offer resistance to traditional forms of enquiry, by working alongside the constraints, attuning to what it might mean to craft learning and learning spaces differently, exemplifying a processual undoing of what it means to enquire, and thereby opening up spaces for 'teachers' and 'learners' to traverse the binaries that hold them to account in systems that fail to value learning beyond tangible outcomes and outputs.

Experimenting para-pedagogy: practicing the dancing of a line

"Pedagogy is most alive in the interstices. Institutionalized, it quickly shifts from an experimental proposition to a regulated system".³

"Education should proceed everywhere, not only in classroom settings - which in fact, at least as usually structured, are among the worst learning environments imaginable".⁴

Press the body of pigment into paper. Sense how the hard edges of the surface melt into a fluid paste. It is the making of solid into liquid, that casts off the burden of form. Take note as it appears in the relation not from body to body but from rhythm to rhythm. Feel the rhythm of line and light dispersing in dust, dancing on the cusp of becoming shape. A force-line for perception in the making. Follow the line: feel how the marks are more-than traces, more-than residue painted onto canvas. They are material becomings. Painting with light is a proposition that entices us to move. This movement is rhythmic. Gillian Deleuze writes:

“[E]ach force has the power to affect (others) and to be affected (by others again), such that each force implies power relations: and every field of forces distributes forces according to these relations and their variations. Spontaneity and receptivity now take on a new meaning: to affect or to be affected”.⁵

What does the body become under these conditions? A sensing in relation? A sensitive tending to how movement is a taking of the dynamic force-of-form that cleaves on the edges of what can be felt.

What moves in the beyond of the painting,
beyond the mark

perhaps, a proposition that forces us to move

we become p/art of the composition

the event inventing its own practice of doing and becoming

living in the more-than of what the canvas can convey

the more-than always in excess of the given

it makes us move

we move to make it appear

in the force-line

that never sits still

continuously refashioning what it means to world together.

Sketch-booking as para-pedagogy

In Figure 1.2 large black sheets printed onto pieces of paper and taped to the floor, is the focal point of a performance piece by Sasha, in her final year of her A-level Art studies. Sasha, who experiences compulsive motor tics, which are irregular and prolonged in movement, creates a collection of photographs of her bodies movement with dust.

We look at the dispersed drawings from the middle of the room. Surrounding me, the students, who are moving together in different directions. Chalk and charcoal are traveling across the space in small plastic containers. Pulling her arm into the center line of her body, Sasha responds by increasing the tension in her fingers, pressing the tip of the charcoal onto the fibers of the paper. The paper resists intentional marks, splintering the burned sticks into a black residue, enveloping the body. The body leaks and seethes, descending the light into floods, as million breathed particles stream out behind her, defusing the air. Entangled in black dust, the body becomes a liquid suspension. The dust sticks and flakes off from her skin. Breaking away from her ears, her eyes, her nose, it chases itself down her arms. Dripping from her fingers. Melting into pools of dust, gathering and swelling out from beneath her feet. The surface of the drawings vibrate, the marks she makes translates movement into textures. Erin Manning tells us, that when form becomes in-formation, the body multiplies.⁶ The charcoal now more-than it was before. Another becoming mixture. She feels the pressure of atmospheres, the weight of the moment inseparably moving around her. Circling her bodying.

Every gesture searches the field, locks into a mode. The world is a knot in motion,⁷ writes Donna Haraway. A sensing in relation. A delicate act of paying attention to how materials carry tendencies that can only be experienced collectively rather than subjectively. To draw from the soil, feeling the

earth through its emerging movements cannot be defined or instructed. It is something that can only be felt.



Figure 1.2. Bodies submerged in dust

What is this lure of feeling? Perhaps, a leaning towards the uncanniness of how materials harbour tendencies, which are processual as well as substantive. The question is how to get taken up in the motion of the capaciousness of bodies bodying, in a surging swirl that is animated in the forcefulness of their incipience becoming. These surging swirls, these affects⁸ engender a mapping of what “dis/connects, excited, startles, interrupts, diverts and reorients”⁹ in child-material agencements. Affects attunes tentatively to how bodies are a field of force driven by intensities, that point out the specificity of each child, each object and each event as unique and full of potentialities.¹⁰ Thinking with affect shifts the need to seek responses but to feel the potential of the event itself.¹¹

Sasha’s movements are a lived experience of painting with light, stretched onto paper. Moving like the air passing through her fingers. Her body in all its latency and fluid scratchiness, lagging behind and shooting ahead of itself. It speaks only of movement, shifting the constrain from following a fixed directionality; and instead embracing a rhythm that enveloped the act of painting, alive with the resonance it creates. It lives in the breathlessness of experience that far exceeds a perceptible form. Sasha paints the dancing of dust, the landscape she populates.

The landscape is not “hers” to take- it creates her in a collective individuation¹² flushed with a creative gesture that moves in the in-gathering of “forces taking form”,¹³ that can never be reduced to a fixed narrative of identify or representation.

Enveloped by dust, (see Fig. 1.3) the camera spans through a collection of frames. The dust is dispersing. It lends an opacity and texture to the air, giving it volume, movement, and atmosphere: it suggests a permeability of bodies as the qualities and materiality of dust are inhaled and exhaled. The dust consists of many pieces: fibers, hair, skin particles, pollen and non-organic matter, such as dirt and minerals. Thinking with the multiplicity of dust: dust gives no attention to boundaries; it moves between and inhabits even the smallest of spaces, making us to reconsider the binaries between singular and multiple, proximity and distance, life and death. The immanent materiality of dust calls forth an empiricism that is directly experienced, that is directly relational; it is an offer to invent with the imperceptible, the undetected.¹⁴



Figure 1.3. dust dispersal

Sketch-booking dust becomes a sensitive tending to all that moves in the-more-than of experience, culling off the edges of what can be perceived within a conventional framing of art practice. In the lack of perceptibility the act of sketch-booking runs beyond the location or object of study and instead moves towards a directionality that is becoming. A becoming-hand-dust-wind-pigment-sweat-body visibilises. In the forcefulness of “visibilisation”, there is a proposition to move away from the simplified binarisation of visible/invisible and to embrace the relational multiplicities of ‘visibilities’ as a creative force in which ‘to make visible’, is to sense a seeing that touches, which is always more-than sight, and which can be further complexified through the use of synaesthetic imaginings. This has affiliation with Deleuze’s concept of “haptic” which “allows the eye to function like the sense of touch” inflicting “upon the eye [...] a tactile, or rather haptic function”.¹⁵ Practicing sketch-booking as para-pedagogy works speculatively with “visibilising” and in this animates the visualisation of the hidden and barely perceptible qualities living in the more-than of the event, opening a world of possibilities for these encounters, which will not always be clear to adults.

It is a proposition that makes felt that body/ing are actively in-formation, working from within the forces and intensities of the incipency of movement, landing on the surface of the event as an intense crowding of sensations. What we see when we look is not a fixed image but the emergence of contours from an interplay of lines. Lines that cut across stagnant places. Lines which intersect in total “chaos, a catastrophe, but.... Also, a germ of rhythm in relation to a new order of painting [that]... unlocks areas of sensation”.¹⁶ We don’t see an image, instead the image touches, it is in the touch of what moves immanently through the forces of a relational dynamic that visibilises a seeing that touches, which is always more-than sight. The act of sketch-booking for Sasha becomes an impression that composes itself across movements. A precise impression is not possible, instead the

shape of a movement is left on the surface, like the half-erased tyre mark on the road. The moment the pigment touches the paper, they leap into action, twirling, spinning, nosediving, and -just occasionally-flying of the hard edges of the frame. Causing the lines to act most often in ways she did not intend. The act of sketch-booking brings to life the amorphous indeterminacy of every moment of becoming activated and becoming demised, in the rising and falling of the subtle and latent qualities surfacing in the middle of things, as the pigments expresses and lives tentatively in fragile mortality on the paper. What Sasha's photographs seems to compel is not a static viewing but an activity of reaching-towards that alters the relation between body and image. Deleuze and Guattari write "practice does not come after the emplacement of the terms and their relations, but actively participates in the drawing of the lines".¹⁷ Or perhaps in other words, the becoming- body ceased to figure in our perception as an object that can be set in motion, and became instead a movement that exists only in drawing a line.¹⁸ In drawing a line, the body's capacity to learn is not confined to a fixed body searching for self-improvement but in relationality with all human and non-human matter, Sasha's bodying is paying attention to the relational and situated movements, recognising that different forms of knowing are made and created in the intersect between the organic and inorganic, human and non-human. This affective force is felt more strongly in these intersects passing through the nervous system, as it enters into relations with other human and non-human bodies.

For Sasha, dust thereby becomes a material agency through its capacity to affect future experiences, a capacity that re-surfaces in feelings, altering the qualities of learning experiences and thus detouring away from the planned trajectory of activities for learning.

"My body flutters in dust. It is an entangled brew. Virginia Wolf writes that we have currents flowing through us. I listen to these currents. I sense thoughts emerging on my skin, a touching of thrilling sparks of sensation. I feel the shivering of the dust when the door encroaches. How the air that sits around the chair, splinters, quivers and escapes when a window is opened. All things have energy. It is here, where my work flows" (Sasha, interview, August 2020).

Where is Sasha taking us here, when she says "All things have energy. It is here, where my work flows?" I wonder what Sasha's body is doing, how is it moving under these conditions? Perhaps, the first step is to suggest that Sasha connects to the dynamism of touch. To touch matter, is to pull forth the active surfacing of an opening for engagement, which makes felt relation, without being told in advance how to move. Sasha is moved by the experience of touching materials and is moving with it. I foreground this because it suggests a redefinition of a body, allowing Sasha to become a conceptual thinker in her own right. It is a proposition that makes felt that body/ing are actively in-formation, working from within the forces and intensities of the incipency of movement, landing on the surface of the event as an intense crowding of sensations. For her, the thrill of catching an inkling and following it's flows, it's movements, is always bursting with speculative potential. It becomes a way of responding otherwise, which troubles curricula that are centered solely on humans as confined entities. In working with the false predisposition that human bodies "are viewed as" the central agency in the classroom, imposes and undermines the pedagogical value of materiality, relegating objects, books and equipment as mere instruments for human usage. Challenging this imposition of body-world separation in educational settings shifts our understanding of agency as distributed and "intra-active"¹⁹ across human and non-human forces. Paying attention to these "entanglements" and "intra-actions" in the classroom animates new readings of how the many doings of human and non-human forces affect our becoming with the world.

In this respect, I find Barad's concept of "intra-action", as opposed to the human-centric notion of interaction, useful in paying attention to the creative potentials of connecting with the non-human, the more-than-human bodies and how Sasha relationally enters into multiple agencements,²⁰ of which she emerges through "intra-action". These things in the making fuse together the potentialities of multiple

energies and forces, working towards an “artfulness” that can create something new in the process of making, as well as in its appearance, which has not been expressed before. Becoming attentive to artfulness in terms of what art practices can do, rather than what they are, foregrounds how, in time, the “more-than”²¹ of the material is felt in which, in the making of material, materials are always actively moving thoughts and sensations, and in these procedural doings, “opening.. a process to its inherent collectively, to the more- than of its potential”.²² In Manning’s words, attuning to the art of artfulness implies:

“This is how artfulness is lived—as a field of flows, of differential speeds and slownesses, in discomfort and awe, distraction and attention. Artfulness is not something to be beheld. It is something to move through, to dance with on the edges of perception where to feel, to see, and to become are indistinguishable”.²³

In this instance, Sasha’s “intra-action” with the camera dust, opens perceptions that are profoundly non-human-centred. As the camera-arms play with the subtleties of dust, it touches upon the unpredictability of a moment, cultivating multiple modes of non-verbal communication to come to life. Moved by dust, Sasha frames the enchanting ways the light transcends through the window, breaking the beam apart as it channels between the tiny dust particles. She pictures how the walls absorb the light and dances with the dust as it settles on its smooth surface and how all this movement affects her relationship with the dust and the dust’s relationship with her. The act of framing becomes an affective field that alters the quality of Sasha’s movability, giving her fluidity and strength to move with more ease. Dust becomes a raw experience that affects Sasha, creating a space of movability but also of disaffect, making it difficult for her to breathe in other spaces.

Sasha: “At home I watch the dust fall and feel the trickle of air flowing into my lungs. I breath in the safety of the rhythm, the harmonic vibrations swarming around my body and tingling through my spine. I exhale into the dust and breath in drops of circles. The air thickens stirring and absorbing the light. In the classroom I feel the negative pressure as my lungs empty. The weight of the moment, as my lungs clench together like bundles of bees nestling under my skin” (Sasha interview July 2020).

How might we value, encourage and attune to what happens between Sasha and dust? I wonder here what dust is doing? What is it making palpable and what kinds of movement of thought is it eliciting? When in school, Sasha said “my lungs clench together,” I wonder what this is saying about breathing, about moving? To clench, to choke, to gasp for air, to be throttled, says much more about the policing, the conditioning, the exhaustion of the body by reducing its capacity to engage in other ways of knowing. With dust, Sasha is attending to how the institution ascribes and utilises its powers. This closing in on complexity is violent, limiting the bodies potential to express beyond the stranglehold of neurotypicality. It emphasises that how we move is always directly entwined with how we are moved.²⁴ And then later she said “Bundle of bees nestling under my skin”. “Lungs clenching” and “bees nestling” may appears oppositional, but noticeably they are not. They make felt the anxiety that pulses through in complex agitation. So when she continues and said “I would much rather be at home, watching the dust settle on things”. Dust takes on a new meaning, suggesting not only settling or stillness but another kind of movement altogether. As forces that could not be seen but could be felt emerge, Sasha instead of denouncing them as unviable, creates techniques to explore how forces are visibilised in the movement of dust. Dust opens up thought as a force of potential by experimenting with the body in movement, and thereby Sasha is inventing ways of seeing that captures sensations in the making. She make us think about all those bodies gasping for air, the violence of breathlessness, that breath too often held when crossing into worlds thickened with neurotypicality.

CONCLUSION

Sasha urges us to conceive how relation grows the capacity to move, practicing other ways of coming into relation, and thereby developing new modes of collaboration, which require a sensitive tending to each singular encounter. Sashas' photographs do not represent a moment in which I do not see an object or human but with affect, forces are being distributed through all bodies (non-human animals, substances, forces, physical matter and energies) in these movements, moments tremble with potential for changing our understanding: not seeing Sasha's ticks and stammers as a disability but as a means to create, to explore the intervals of movements, rippling through the sensations and intensities of the event.

NOTES

¹ There is an attempt here to allude to Karen Barad's notion of "intra-action" (2007) to which the allusion enables a sensing of these entangled becomings, which you will meet through students' intersecting in the event, which animate entanglements: where fleeting encounters arise, where wondering occurs which ignite and spark momentary movements, *melding*, becoming something other, something different together. Unlike interaction where differences are carried to the event, in the eventfulness of intra-activity, differences are always being made.

² Erin Manning, *For a Pragmatics of the Useless*, (Durham, NC: Duke University Press, 2020), 158.

³ Erin Manning, *Crafting Parapedagogies: Artful Living*, Available at: [www.CraftingParapedagogies: Artful Living](http://www.CraftingParapedagogies.com) - by Erin Manning (Accessed: 20 April 2025).

⁴ Martin Durberman, *Black Mountain: An Exploration in Community*. (New York: Anchor Press, 1973) 27.

⁵ Gillian Deleuze, *Foucault*, (London, New York, Oxford, New Delhi, Sydney: Bloomsbury Academic, 2020) 60.

⁶ I am drawn to Erin Mannings hyphenation 'in-formation' as a way of thinking-with what a body can do, rather than what a body is, which challenges the traditional binaries and dualistic constructions of practice. More on this in Erin Manning, *Always more than one: The collectivity of a life*, *Body and Society*, 16(1), 118.

⁷ Donna Haraway writes "It matters what matters we use to think other matters with; it matters what stories we tell to tell other stories with; it matters what knots knot knots, what thoughts think thoughts, what descriptions describe descriptions, what ties tie ties. It matters what stories make worlds, what worlds make stories." Donna Haraway, *Staying with the trouble: Making kin in the Chthulucene*, (London and Durham: Duke University Press, 2016), 13.

⁸ Gillian Deleuze and Felix Guattari, *A Thousand Plateaus: Capitalism and Schizophrenia*. (Minneapolis: University of Minnesota press, 1987). Also see Brian Massumi, *The Politics of Affect*. (Cambridge: Polity, 2015).

⁹ Bessie P. Dernikos, *Tuning into 'fleshy' frequencies: A posthuman mapping of affect, sound and de/colonized literacies with/in a primary classroom*. (*Journal of Early Childhood Literacy* 20(1): 134–157, 2020) 4.

¹⁰ Gail, Boldt and Kevin, M. Leander, *Affect theory in reading research: Imagining the radical difference*. (*Reading Psychology*, 41(6): 515–532, 2020).

¹¹ Christian Ehret, *Propositions from affect theory for feeling literacy through the event*. In: Alvermann DE, Unrau NJ, Sailors M and Ruddell RB (eds), *Theoretical Models and Process of Learning Literacy* (7th ed.). (New York: Routledge, 2018) 563–581.

¹² Drawing on Whitehead's process philosophy, Manning brings into focus how the body can be better understood in relation. "Individuation does not bring life into an individual. The individual expresses a life as the force of its continuing individuation. The individual is but an aspect of being's becoming. A body as individual is relational more than substance, in relation, always, with the discontinuous force of becoming, with life in all its forms. The body never fully actualises" (Manning, 2010, p. 121).

¹³ Erin Manning, *For a Pragmatics of the Useless*. (Durham, NC: Duke University Press, 2020).

¹⁴ Steven Connor (2007) refers to Marcel Duchamp's *Air de Paris* as a performative agency and conceptual encounter of dispersed and dusty matter. Duchamp, to give volume to the flurry of Parisian air, bottled the dusty particles in Le Havre and exhibited the work in New York.

¹⁴ Michael Fried (1998) in relation to Jackson Pollock speaks of the abstract line as multidirectional, with neither inside nor outside, describing no contour, passing between colours and textures, filling a smooth space, sensing a haptic visual matter that "both invites the act of seeing on the part of the spectator yet gives his eyes nowhere to rest once and for all" (p. 14).

¹⁵ Gillian Deleuze, *Francis Bacon: The logic of sensation*. 1st ed. (Minneapolis: University of Minnesota Press, 1981) 122.

¹⁶ Gillian Deleuze, *Desert Islands and Other Texts 1953-1974*, edited by David Lapoujade. Translated by Michael Taormina. (South Pasadena: Semiotext(e) 2004) 83.

¹⁷ Gillian Deleuze and Felix Guattari, *Kafka: Towards a minor literature*. Translated by D. Polen. Minneapolis: University of Minnesota Press, 1986) 203.

¹⁸ Michael Fried (1998) in relation to Jackson Pollock speaks of the abstract line as multidirectional, with neither inside nor outside, describing no contour, passing between colours and textures, filling a smooth space, sensing a haptic visual matter that "both invites the act of seeing on the part of the spectator yet gives his eyes nowhere to rest once and for all" (p. 14).

¹⁹ Karen Barad, *Meeting the universe halfway: Quantum physics and the entanglement of matter and meaning*. (Durham, NC: Duke University Press, 2007).

²⁰ “Agencement” can be affiliated with the relationalities in Spinoza’s claim that all bodies possess the capacity to affect and be affected. In the same vein, Jane Bennett (2010) has brought together distributed agency and the vibrancy of matter with the term “agentic assemblage” (p. 20). The “agentic assemblage” diminishes any organisational principles, by indicating how the agentic energies of materials are processually and compositionally always on the move, moving a collective bodying, carrying an indeterminacy of its affective forces, which lives in the knowing that relations move bodies. So, perhaps in the affective potentialities of “agencement”, forces are always forming, suggesting how affect is the continuous force of bodies ever-changing form. Therefore, this writing prefers the usage of “agencement” to “assemblage”, as it feels more active and more processual.

²¹ Erin Manning, *The minor gesture*. (Durham, NC: Duke University Press, 2016) 33.

²² Erin Manning, *Always more than one: Individuation’s dance*. (Durham, NC: Duke University Press, 2013) 118.

²³ Erin Manning, *Always more than one: Individuation’s dance*. (Durham, NC: Duke University Press, 2013) 59-60.

²⁴ Alfred North Whitehead, *Process and reality*. (New York: Free Press, 1978).

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RAISING CONSCIOUSNESS THROUGH FEMINIST PEDAGOGY IN ANIMATION

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INTRODUCTION

Exploring collective practice and collaboration with external experts to develop a method of integrating feminist pedagogy into creative HE environments using animation as a feminist tool. This case study focuses on two student-made films, *Why Mums Don't Jump*¹ and *Sling the Mesh*.² These projects resulted from a collaboration between groups of mixed-gender, second-year Animation students at Falmouth University who were invested in the subject of female reproductive health and their live-brief clients, Helen Ledwick, podcaster, author and creator of *Why Mums Don't Jump*³ and Kath Sansom journalist and founder of the pro-bono campaign *Sling the Mesh*.⁴

This article embraces the opportunity to reflect on the methodology and success of learning outcomes based on interviews with participants and audiences. Initial feedback and testimonials indicate that the films were received as pioneering animated stories, granting visibility to a hidden condition known as “pelvic organ prolapse”, often experienced by women postpartum. Audiences' recognition of the film's attitude-changing potential testifies to Wells' view of animation as 'a radical tool in the re-invention... of social, cultural ... materials'.⁵ This case study demonstrates that when animation addresses the need for social change, student work can contribute to the visibility of hidden discrimination and social debates around female reproductive rights. The students' engagement with the process exemplifies their temporary entanglement with what Ahmed once called a “sweaty concept”⁶ to bring out hidden gender inequalities and generate new social understandings.

Although this is not a definitive recipe for educating socially aware animators, analysing this project stage-by-stage, there is an attempt to outline one potential teaching strategy for promoting gender awareness among HE students in creative disciplines.

Taboo

It would not be surprising if as you read the introduction to this article, you have had a visceral reaction to its subject matter. The topic of pelvic floor health is taboo and often associated negatively with disgust.⁷ However, if you continue to read you will discover a research project that challenges these expectations and see how the use of feminist pedagogy, applied through action research and standpoint theory, can help students engage with and experience the topic in new ways that adds beauty, empathy and action in contrast to the shame, isolation and feelings of disgust. Their creative practice has helped move the topic of pelvic health from individual stories shared in private spaces into art forms that have been shared in public spaces: moving from the private to the public; from

isolated shame to shared public joy. This process of intervention and bringing the topic into arenas it has not previously been, is an intentional feminist intervention by staff to push these conversations into the public domain and hopefully public consciousness.

Personal

This research prioritises personal experience and intentionally curates briefs that facilitate students, staff and professionals to work side by side on creative outputs with an ambition to create social change. The problem the research seeks to address is the lack of information and cultural silence relating to women's post-partum pelvic health. A mantra that often appears is 'Why did no-one tell me?'.⁸ How can animation as a feminist tool help to move the conversation of postpartum pelvic floor health from private despair to shared public joy for the purposes of social change? The responses to the research so far reveal how ground-breaking the work is, 'I've never seen anything kind of creative, filmic (before), about prolapse at all, which is extraordinary...just being able to say it out loud takes the shame away'.⁹

Private to public

Pelvic floor dysfunction is such a difficult topic to live with and to bring into the world. I definitely relate to Ahmed's "sweaty concept"; It is a hard life to live and a hard one to try and bring into public discourse. I was struggling in my own private life with my own negative experiences with postpartum pelvic organ prolapse and exasperated by the isolation, lack of information, lack of community and lack of medical care. In frustration I was venting to a pain nurse about the lack of informed care and she looked me dead in the eye and said 'Why don't you do something about it?'.¹⁰ I was shocked at this response as we think the medical professionals are there to help us, not the other way around, but over time it dawned on me that there are hierarchical powers structures around them that may be preventing meaningful change. It made me realise that perhaps it couldn't be an inside job and the medical profession needed intervention from the outside. I wracked my brains for how to help, and inspiration struck in the form of *Why Mums Don't Jump* creator Helen Ledwick. Here was someone who had already moved their private experience into public discourse with the release of their podcasts series.¹¹ Ledwick's own journey took her through a series of events that ultimately gave her the inspiration to go public¹² - It takes a while to realise that this is a topic worth talking about with others. I would use the term "confidence to go public" but that would be wrong. You don't feel confident, you are terrified, but you are motivated enough to take the risk. Her courage was rewarded with overwhelmingly positive reactions from the students, which ranged from recognition 'My mum has that',¹³ to determination 'I must work on this live brief, I don't care what it takes, I must work with Helen!'.¹⁴

TEACHING ANIMATION

Every year staff run three briefs for the students to work on that tackle important topics that may not otherwise have access to short, animated film production. The client briefings take the form of a traditional lecture with presentation slides and written briefs. The students can choose from three different live briefs that are presented that day and then have fifteen weeks to produce a short, animated film in a medium of their choosing. There are milestone screenings of work in progress at four intervals to allow reflection and client feedback and the students are allowed to contact clients directly to share work and feedback through emails. The students also meet staff once a week to discuss and reflect on their progress. Once the *Why Mums Don't Jump* and *Sling the Mesh* films were finished, they were entered into the film festival circuit and released on *YouTube*. These films create a vehicle that drives conversations around pelvic health via their conception, creation and distribution,

which seems to provide opportunities for the exchange of new knowledge and understanding: from the moment the students read the brief for the first time to when they go on stage to collect accolades for their work. See Figure 1.



Figure 1. Photo: Students receive 'highly commended' at the Royal Television Society Devon & Cornwall Student Television Awards for their Film *Why Mums Don't Jump*.

Why animation?

What is powerful about animation is its potential for the external representation of internal worlds, which makes it very valuable on projects that seek to make these very private experiences public, in a way that helps audiences relate or empathise with the stories being told. The recent book *Intimate Animation*¹⁵ by Ben Mitchell and Laura-Beth Cowley captures the zeitgeist of a recent surge in animated films that explore deeply personal experiences relating to body image, sexuality and sex. Their book was developed from their podcast of the same name which draws upon the increasing amount of films on these topics that they noticed had been appearing in the festival film circuit since the late 2000s/early 2010s. Historically, animation focused on titillation with the use of Mutoscopes depicting pornographic scenes¹⁶ and the sexualisation of characters, such as Betty Boop and Jessica Rabbit, but what Mitchell and Cowley note is that animation is increasingly being embraced to communicate internal experiences of sexual encounters, fantasies and sexual awakenings - not only what occurred but how it feels. Looking through the examples in their book, you can see how these filmmakers have used metaphor, textures, movement and sound as an emotional palette to convey their personal experiences.

Conversation starters

The light-hearted perception of animation has the potential to make taboo topics more palatable. Recent animated tv series like *Big Mouth*¹⁷ had an intentional ambition to normalise conversations around puberty and leans into the extremes of what animation can offer with the creation of their "Hormone Monster" characters which help externalise the "monstrous" feelings teenagers may encounter.¹⁸ This light-hearted approach is something Ledwick wrote into her brief for the students. Ledwick is aware that the topic of pelvic health can get quite depressing and negative and so her brief requested that the approach should 'Find a way to balance heart-wrenching stories with a hopeful, fun and humourous tone.'¹⁹ To do this successfully required diligent research by the students to fully understand the lived experience. What is valuable about clients like *Why Mums Don't Jump* and *Sling the Mesh* is that they both have large communities and a data set of interviews to draw quantitative and qualitative data from. *Why Mums Don't Jump* has fifty-two episodes across five series which the

students divided amongst their team. They listened to every episode, taking notes of the quotes that stood out to them. The students then wrote a film script using these quotes. As they immersed themselves in these experiences, they started to explore creative ways of representing them on screen. The students chose to have human characters but have them living through striking visual experiences that lean into surrealist and expressionist art forms. Their work successfully draws on metaphor to encapsulate complex problems in simpler forms: a woman drowning in bed as she talks about her struggles with incontinence; a women engulfed by a giant baby as she talks about how she's feeling overwhelmed by her suffering. The students' creativity invites the audience into this inner world and to understand what the protagonist is suffering. The beauty of their design work contrasts with the difficult subject matter and helps to move the conversation away from shame and disgust that is usually associated with this topic. See Figure 2.



Figure 2. Stills from the film and festival laurel, *Why Mums Don't Jump*.

CENSORSHIP

Initially women in their isolation assume they were stupid and their injuries are their own fault but eventually they realise that they are not alone and that they were not informed.²⁰ This shift in perception has largely been down to online communities where the sheer volume of shared experiences evidence there is something larger at play. Where feminism comes in is helping to explain the larger structures that influence women's censorship and self-censorship. Doctors explain why they withhold information because women will be, 'too scared to give birth',²¹ implying that women can't handle the truth. Men and women often seem to have internalised patriarchy, as I have had colleagues say to me that it is 'just something to get on with' and 'don't want to frighten the students', 'just what happens', 'what did you expect?'. But Hooks suggests we must be 'critically vigilant to both what is being told to use and how we respond to what is being told to us' and to "free ourselves" from these narratives - To have conviction in our own realities, our own lived experience.²² The sheer volume of powerful testimonies that Ledwick and Sansom have collated reveals there is something larger at work, in the words of Hooks, 'there is some system here that is hurting her'.²³ The first wound is the birth injury, but the second wound is the isolation, then the ongoing abuse is

denying there is a problem. The live brief creates a wonderful opportunity to “resist and create”.²⁴ There are a lot of barriers which creates the hard work of bringing this topic into public spaces. You censor yourself and others try to censor you: some colleagues reactions have been, ‘you don’t want to scare the students’, but something that this research bring to light, is that these students are living it anyway, as one student said ‘I have had my own experiences...my mum has ... I’ve seen how people can suffer’.²⁵



Figure 3. Still from the film, *Sling the Mesh*.

Women as experts on their own bodies

Standpoint theory invites acknowledgement that there may be power dynamics at play that influence accepted knowledge and understandings and that marginalised voices can have the potential to offer valuable insights.²⁶ Sansom, Ledwick and I are not medical experts but we are experts at the lived experience. Standpoint theory explains why those considered on the periphery or those who don’t have recognised expertise can still provide valuable insights which could improve knowledge.²⁷ It also explains why the students’ experiences and voices have value. What this research reveals is that some staff have assumed that they don’t want to scare the students by introducing this knowledge but don’t realise that the students are living this life anyway, either because the students have their own pelvic health dysfunction or a member of their family does.²⁸



Figure 4. Still from the film, *Why Mums Don't Jump*.

Commercial versus independent filmmaking

Students who choose to study animation are often inspired by commercial tv series or feature films and have ambitions to work on similar shows or have similar careers. What education provides is the opportunity to broaden their horizons about what animation can be. On the animation course at Falmouth University students are introduced to independent filmmaking, shown artists they have not encountered before and invited to explore the history of animation. Our live-brief module invites them to apply their creative skills to real world problems and in doing so experience what animation can be as an agent of change. The challenges they are given by their live-brief client may be problems they've heard of before like climate change or disaster relief. This case study focuses on the issues that are brought to the students, issues that are on the periphery, that aren't well-known and need help to bring them into public discourse. The students get to experience in real time their reactions to such briefs and surprise themselves. A student reflecting on their experience noted their shift in perception from, 'Wow that's a lot to come into...I'm not too sure' to 'We need to work on Sling the Mesh!'.²⁹ What seemed to transform the students understanding of the subject matter happened after seeing Sansom give a professional briefing explaining her campaign but also Sansom being visibly moved to tears by the end of her own presentation - her personal experience helping to make the data presented more meaningful. The students go from not knowing about the topic at all to knowing it at a deeper more emotional connection, from being an outsider to an insider. They see the struggle and they see they can act as a bridge between this not knowing to knowing. As a student explained 'it just really highlighted why it was important because these things don't get talked about'.³⁰

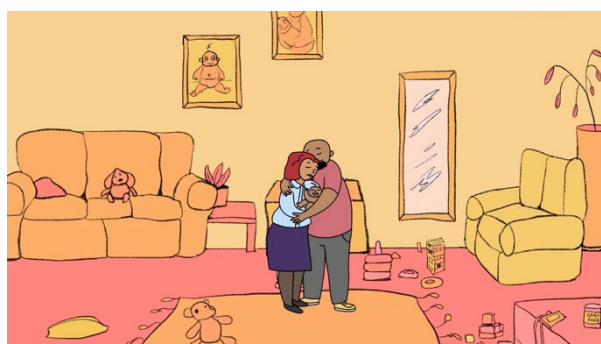


Figure 5. Still from the film, *Why Mums Don't Jump*.

Internal versus external

Animation has provided an opportunity to move verbal testimonies into visual art forms, from digital podcasts into physical art forms created for public display in exhibitions; stills from the film were painted on canvas to create an art exhibition that ran alongside workshops to design your own vulva cake³¹. The exhibition was part of the unfunded pathway on the Being Human 2024 festival entitled *Why Mums Don't Jump: Our Stories, Our Health*. Unfortunately, the exhibition didn't receive funding via Being Human because the exhibition idea was not deemed 'innovative' enough even though the film is potentially the first time the lived experience of prolapse has been seen in film. Data collected from the exhibition revealed how valuable participants had found it³² and there were some public epiphanies during workshops where participants acknowledged publicly for the first time that they had pelvic floor dysfunction but had just 'pushed it to the back of my mind' and 'just got on with things', revealing an internalised bias that this is "just what happens to women" and is not to be discussed openly. It brilliant to see these conversations starting to happen as the topic journeys through the classroom, staff room, Instagram, awards ceremonies, radio interviews, news articles,

exhibitions and workshops. What is seen in the students' work is the topic of pelvic floor dysfunction being made beautiful and joyful - a feminist ambition to imagine a better future: women run arm in arm as they run a marathon to raise awareness: a woman is comforted by her partner: a stranger reaches out to offer support to another woman struggling. See Figure 4, 5 and 6.

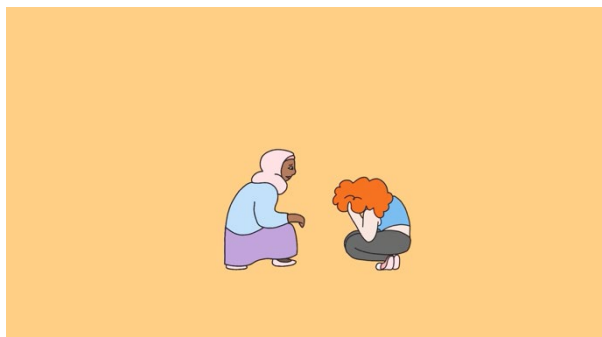


Figure 6. Still from the film, *Why Mums Don't Jump*.

CONCLUSION

The creation of these films and their distribution created not only professional experiences for the students, but they also got to experience living a feminist life. They learnt how to make a short, animated film and how to release it on the festival circuit but they also learnt about bias, what their own biases were and how important sharing personal stories is. They have seen firsthand how valuable creativity is for its potential to empower marginalised voices and to imagine a future that has joy instead of despair. As the students watched their film screen at the Royal Television Society the presenter gave a special mention, 'And who knew issues surrounding women's pelvic floor could be captured in such an engaging and sensitive manner in the beautifully handled *Why Mums Don't Jump*'.³³ The students were interviewed from the red carpet in Hollywood, and the interviewer acknowledged their own connection to the material, 'So I gotta ask why this subject, you know my mum has this, and I gotta say we need to talk about this!'.³⁴ However, despite the joy and glamour the reach seems to be limited by a lack of willingness to reshare the material online. Despite *Why Mums Don't Jump* and *Sling the Mesh* having large audiences of between nine thousand³⁵ and ten thousand,³⁶ the active social-media engagement of "likes" has been limited, potentially because people are still struggling to overcome the perceptions of shame and disgust and don't feel ready to publicly acknowledge their connection to the material. The struggle continues as Ahmed says, 'Sweaty concepts are also generated by the practical experience of coming up against a world, or the practical experience of trying to transform a world'.³⁷ However, there are glimmers of hope as the word spreads, so too does the confidence to go public, 'one of our members said it gave her the confidence and push she needed to share her own mesh art exhibition',³⁸ and one of the student animators acknowledged that they found the experience rewarding, 'I think it was it was a real privilege that our first real experience making films as learning animators got to be for something that was so important and impactful'.³⁹

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NOTES

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INCREMENTAL IMPACT THROUGH POLYMATHIC DESIGNERS

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INTRODUCTION

There has long been debate and divide between specialisation and generalisation. The age of enlightenment saw the emergence of the “renaissance man” who dabbled and explored across domains of art, science and engineering.¹ More contemporary examples could be individuals like Nathan Myhrvold, working across the fields of computer science to cooking. This same divide between specialisation and generalisation is present in academia, with persistent calls to transdisciplinary collaboration or other forms of silo breaking yet, silos persist. “As it stands, the widespread system of specialisation is leaving you clueless about the world and your place in it”.² However, there are continually examples of generalisation or polymathy, especially out of necessity. This could appear haphazard, but in certain contexts like agriculture a farmer must wield a range of skills and expertise during daily activity, out of necessity. To illustrate, a social media post (Figure 1) makes the joke “Die verskil tussen n boer en n welder” which translates to “the difference between a farmer and a welder” as it reveals a messy and leaking welding job and the person speaking says, “n welder dink nie hy kan boer nie” (a welder doesn’t think he can farm).³ The humour in this post focuses on the bad weld, but also the fact that farmers would routinely undertake tasks outside of their typical expertise, simply to get things done.

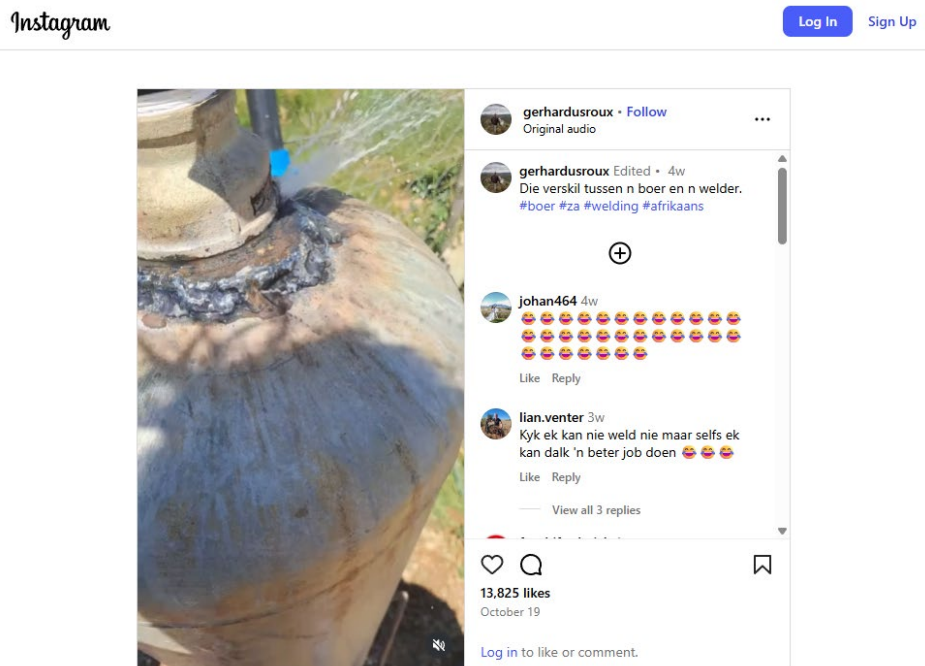


Figure 8. Instagram post illustrating the polymathic behaviour of farmers⁴

This all builds on the sentiment of disciplines or subjects not being “...‘natural’ or ‘god given’, but are something that came about from the history of science, and that their boundaries are often not theoretical, i.e. systematically determined, but are rather historical”.⁵ In terms of design and architecture there appears to be an emergence or renewed focus on this. Furniss describes it as: “Now, 100 years since the formation of the Bauhaus, it would appear we are again at a similar moment, with the rise of the ‘polymath interloper’. The specialist has not gone away, but many practitioners now defy traditional classification in favour of moving fluidly across the fields of art, design and architecture”.⁶ This terminology is very similar to that of Seymour referred to by Dykes et al, saying “...design is beginning to show signs of splitting into two new disciplines and ultimately creating two different types of designers – (1) the ‘specialist executor’ and (2) the ‘polymath interpolator’”.⁷ In both instances they refer to the emergence of the polymathic designer or generalist. Which according to Furniss very few studies have explored.⁸

This polymathic practice should not be surprising, especially in Industrial Design and Architecture. *Industrial Design* is described as transdisciplinary profession,⁹ with the focus shifting from the mass production of products to more complex multifaceted problem solving. The conceptual definition of the word *Architect* exhibits the idea of orchestrating different skills and profession into a cohesive plan. The emergence (or renewed focus) of polymathic behaviour could be a result of complexity where more traditional roles of specialisation no longer fit. This echoes the concepts put forward in the DesignX position papers.¹⁰ With the ‘X’ in the DesignX hinting to the complexity of the challenges being addressed by design, being ill structure and undefined. The ‘X’ may also be hinting at an ill-defined individual, able to address these complex challenges. Part of the reason these challenges and those associated with addressing them are hard to define, is that they are undergoing constant change, requiring adaption. These are therefore adaptable individuals developing adaptable solutions to have real world impact. This is particularly apparent in contexts like the global south where there are the added complexities of often conflicting degrees of development, education and technology. But with climate change, technological disruption and an increasingly unstable global order, similar challenges exist everywhere.

PROBLEM

Polymathic behaviour exists; it has the potential to have an important role to play in achieving incremental impact on contemporary challenges. But as Furniss notes “...few studies have explored this disconnection between evolving polymathic practice and specialization in higher education”.¹¹ For higher education to remain relevant and have real world impact this polymathic behaviour needs to be better understood, and pedagogies may need to adapt to support it. However, with little understanding of this emergent polymathic role and why, and when designers might become or adopt it, opportunities for incremental impact through these individual designers could be missed. With greater clarity of this emergent practice, pedagogical strategies can be adapted to develop and foster this type of behaviour.

METHOD

A scoping of existing literature was undertaken on the topics of polymathic practice, specifically in Industrial Design and Architecture. The initial scoping focused on the terminology of polymath interloper¹² and polymath interpolator,¹³ from the publications referred to. These terms were found in publications that were associated with polymathic practice and transdisciplinarity. The inclusion of the additional descriptors of interloper/interpolator adds focus to the strategic choice for the polymathic behaviour. *Interloper*¹⁴ from Furniss implies being unwanted or not belonging, while *interpolator*¹⁵ from interpolation by Dykes et al and Rogers implies filling a gap. The approach was to initially search for the precise terminology linking it specifically to Industrial Design and Architecture and then incrementally broaden the scope by reducing the specificity and integrating related terms and concepts.

The use of these combined terms was very limited and predominantly linked back to the original authors. However, the broader concepts of polymath and polymathic behaviour had more results. When terms linking to transdisciplinary collaboration were also included in the search, the scope broadened significantly. Throughout the scoping common threads were identified. These are then used to critically examine the concepts and draw some conclusions but predominantly propose further research through a more systematic review of literature.

FINDINGS

We present the polymath interpolator designer (PID), who is problem-project focused and aims to develop not optimised, ‘so-called’ permanent solutions, but rather incremental satisficing solutions that tread more carefully in complexity. Through the scoping three attributes to the PID were identified. The first, like transidisciplinarity, is that of problem focus. Terms like “take what you need”¹⁶ approach was a recurring concept. This links back to concepts of “satisficing”¹⁷ or “just enough”. Demonstrating a temporary or “as needed” strategic skill/knowledge development to address the challenge. Secondly there is a certain degree of context adaption. This links to the concept of gap filling or interpolation as the context requires a gap to be filled. The problem being situated is important but the context constraints like available expertise or even resources available to source expertise, drives and necessitates the polymathic behaviour. Then thirdly the availability of knowledge. The emergence or possibly re-emergence of polymathic behaviour and the possibility of this being temporary or “as needed” is made possible by information and tools that far more accessible. This has links to DIY and the maker/hacker culture, but this is also an enabling factor for both polymathic and polymath interpolation in design.¹⁸

Firstly, the additional scoping choice of Architecture and Industrial Design is explained then each of these three attributes is described. This however remains a scoping review, and a further systematic review is recommended.

Polymathic behaviour in Architecture and Industrial Design

Although there is the broad focus is on the “creative polymath” this review aimed to further focus on Architecture and Industrial Design. These two design professions, as opposed to most other typically creative disciplines have less of a ‘communication only’ focus, often interfacing with typically ‘engineering’ disciplines more often than typically ‘arts’ disciplines. This introduces an interesting dynamic for the polymathy and subsequent interpolation as the interfacing with these engineering disciplines breaks it out of what is normally considered the ‘creative’ disciplines. Within this lies the opportunity to explore the transcendence beyond creativity, which may be inherently polymathic, to include more technical orientated activities within the polymathic behaviour.

Industrial Design has its origins in the mass production of objects, originally focused on “formal qualities”.¹⁹ But the new definition released in 2016 after the 29th General Assembly of ICSID (International Council of Societies of Industrial Design) acknowledged the discipline as being transdisciplinary.²⁰ This transdisciplinary intent is not only in terms of collaboration but also in the activity of Industrial Designers, hence the link to polymathy. This shift was not only in definition but also with the focal areas and projects undertaken, shifting to a more sociotechnical focus.²¹ This is seen in the definition including not only ‘product’ but also “system, service and experience”.²²

Architecture in the same way has long since moved beyond the “design of buildings” into a diverse range of activities. More recently, once again with, the rise of digital tools and systems, there has also been an increase in engagement beyond typically ‘Architecture’ to fields of robotics, materials, biology and beyond. Digital fabrication, and the even the resurgence of timber, in particular engineered timber, as a building material²³ also has driven changes in typical architectural processes and requires a more diverse competency profile.

Problem focus

The problem focus of this polymathic behaviour, like transdisciplinary collaboration, aims to include and involve a diverse range of insights to address a challenge.²⁴ This also is echoed by Root-Bernstein & Root-Bernstein who describe a ‘creative polymath’, which is closely related to a polymath designer, as adopting a “‘take-what-you-need’ approach as opposed to a ‘master-the-entire field-first’ approach”.²⁵ This approach links to the term interpolation, noted above which fills “gaps”. This gap filling strategy is attributed to a problem focus, because the primary motivation of the polymathic behaviour appears to centre on addressing a challenge as opposed to curiosity or broad interests. In the comparative case study of five design studio that “defy classification”²⁶ it is noted by Furniss, that when asked to define themselves or their work, “[m]ost of the responses describe the work itself rather than the worker”.²⁷

Context Adaption

Although not directly described as polymathic or even transdisciplinary the link to the maker/DIY culture is important to make. Do-it-yourself already implies that instead of a relying on a “expert” or described differently, specialist, you undertake the activity yourself. Campbell describes the two types of makers, the first, a creative consumer, exists because of “decentralized and affordable technology, such as rapid prototyping” (see next section) while the other is “improvised or makeshift solutions born from ingenuity and cleverness by knowledge-rich, economically poor people”.²⁸ In both situations the DIY/maker have a context dependant reason for taking on tasks maybe not specifically within their expertise. This same context driven interloping, or more positively, interpolating could exist in what would be described as a more ‘formal’ environment. Rogers describes the emergence of the polymath interpolator designers because of a shift to a more people centred era of design²⁹ which aligns with sociotechnical concepts put forward by the Norman and Stappers.³⁰ It is also worth

making the link to the intrinsic complexity of any sociotechnical challenge, that is, wicked problems.³¹ These contexts are therefore indeterminate and therefore require adaption.

Information Access

As with the DIY/maker the context can drive the need for polymathic behaviour but also provide the conditions for it. Many of the authors noted the rise of digital technologies being an enabling factor.³² This could both be considering the access to information, but also the tools as well as the ability to share and collaborate.³³ Araki in his dissection of polymathy details the *mathma* as “a cognitive structure that stems from a deliberate effort to encode, organize and systematize sets of information”.³⁴ Being able to do this requires access, open systems and knowledge sharing has seen exponential growth and continues to grow. New systems like machine learning and large language models could potentially assist in the ability to quickly search, sort and digest the information, but may also inhibit the breadth factor (poly). But this is beyond the scope of this scoping review.

Polymath Interpolator Designer

The Polymath Interpolator Designer (PID), offers a needed complementation to specialist solutions. Project-problem focused pedagogy could help foster this type of Industrial Designer and Architect, particularly when the teaching project spans disciplines and is not simply a repeated exercise in typical practice. The teaching projects need to have real-world complexity and problem focus. Intentionally leaving or not addressing needed, knowledge/skill gaps that may fall outside typical disciplinary domain can create the gap that needs to be filled, driving polymathic behaviour. Allowing and requiring the use of tools and information to have “messy”/partial solutions to parts or a problem/challenge can also drive PID behaviour. Strategically integrating these into project-based curriculum can incrementally drive more PID behaviour.

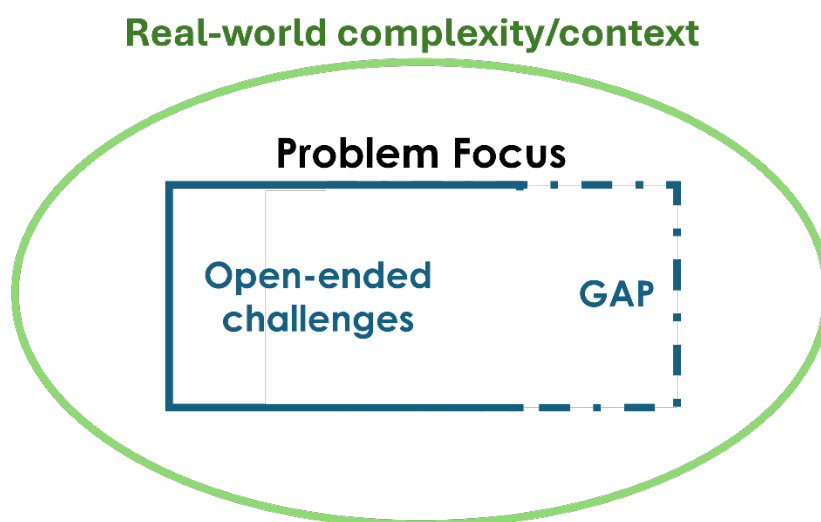


Figure 9 Project structure to drive Polymath Interpolator Design behaviour.

Figure 3 aims to illustrate a framework for possible project structure for foster Polymath Interpolator Design behaviour. This, however, needs to be tested and refined in addition to a more systematic review of existing literature.

CONCLUSION:

Polymath Interpolation especially in Architecture and Industrial Design offers an opportunity especially in addressing sociotechnical challenges. Not developing or fostering this type of behaviour may result in missing these opportunities for incremental impact. Project based teaching in Industrial Design and Architecture pedagogy is not new and remains critical, however, careful consideration of the type and nature of the projects is important. The structure of projects could allow for the development of both specialists as well as the emergent polymath-interpolator designer (PID). By internally cultivating the environment that may encourage PID in simulated contexts, like project-based teaching could allow future designers to be more at ease in changing contexts and complexity. Further experimentation into how to foster PID behaviour and develop these future designers is needed. They have a potentially important role in developing “satisficing” or incremental solutions to have incremental impact on so called DesignX challenges.

NOTES

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- ⁴ Instagram, "Gerhardus Roux on Instagram."
- ⁵ Jürgen Mittelstrass, "The Order of Knowledge: From Disciplinarity to Transdisciplinarity and Back," *European Review* 26, no. S2 (October 2018): 71, <https://doi.org/10.1017/S1062798718000273>.
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- ¹⁴ Furniss, "Beyond Discipline," 3.
- ¹⁵ Dykes, Rodgers, and Smyth, "Towards a New Disciplinary Framework for Contemporary Creative Design Practice," 101; Paul A. Rodgers, "'Polymath Interpolators' - The Next Generation of Designers," September 13, 2007, 1.
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- ²² WDO | About | Definition of Industrial Design.
- ²³ Libo Yan, Haoze Chen, and Junaid Ajaz Dand, "High-Rise Timber Buildings: Benchmarks in Structural Systems, Fire Safety, Prefabrication Efficiency and Environmental Insights of World's 10 Tallest Completed Mass Timber Projects," *Frontiers of Architectural Research*, January 2026, S2095263525001657, <https://doi.org/10.1016/j.foar.2025.10.012>.
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AN EXPLORATION OF POETIC ECONOMICS THROUGH ILLUSTRATION TEACHING AND LEARNING WITHIN COMMUNITY-ENGAGED PROJECTS

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INTRODUCTION

This paper explores the concept of poetic economics through illustration teaching and learning within community-engaged projects. Poetic economics ‘...explores how creative, aesthetic, and ethical knowledge can transform our economic systems to offer fresh perspectives on our most pressing challenges.’¹ Illustration practice has historically been seen as a commercial practice, which responds to a brief for a specific application, for example, a magazine, newspaper or book.² However, with less revenue made from printed formats, contemporary illustrators are necessarily broadening the scope of their practices, often adopting a ‘portfolio career.’³ Such a career might involve freelance commissions, selling work independently through online shops and in-person creative markets, teaching, and running creative workshops. In tandem with commercial changes are shifts in the scholarship of illustration, prompted by an adoption of practice-based research methods in university settings that seek opportunities for increased research and funding opportunities. With these shifts in industry and Higher Education (HE), there are emerging opportunities for illustrators to rethink their practices, and for educators to explore teaching illustration within new contexts, which can provide learners further autonomy, diverse practices and connections with audience.

Rationale

As a lecturer in illustration, I am interested in how creative education can prepare students for an uncertain future by developing Learning for Sustainability (LfS) competences such as critical thinking and empathy.⁴ In addition, through real-world experiences that connect communities and University students through meaningful interactions, the narrative of AI taking over creative work can be countered. Examples of community collaborations include MA illustration students working on an exhibition at The Waterways Museum, Gloucester and The Folk, part of the civic trust also in Gloucester (see figs. 1-3), which are discussed later in the paper. Working within these heritage and community organisations enabled students to equally contribute to outcomes, which fostered collaboration between peers, confidence in engaging with the public, and the experience of skills-sharing. In this paper, I argue that such community-based projects can equip students with competences that assure creatives of their place in the world, as well as the professional skills needed to build confidence in their practices beyond the university.



Figure 10. The Waterways Museum, Gloucester, UK



Figure 11. Hundred Heroines, Nailsworth, UK (relocated from Gloucester since the project)



Figure 12. The Folk of Gloucester, UK

ILLUSTRATION IN A CHANGING ECONOMY

As with all forms of art, the techniques and applications of illustration change in relation to developments in technology, society, and scholarship. To give a broad definition of illustration, I refer to Alan Male, illustrator and academic, who describes the discipline as an ‘...applied imagery, a working art that visually communicates context to audience.’⁵ Illustration has hitherto and popularly been categorised as primarily a commercial art:

‘Illustration [...] is contextualized visual communication commissioned for target audiences, often reproduced in large quantities and distributed via the ever-expanding creative, media and communication industries.’⁶

To reflect commercial practice in creative education contexts, live briefs have been used as ‘real-world’ projects whereby students are asked to answer a brief set by an external organisation by researching and developing a creative solution. Work placements are also often a component of illustration teaching that prepare students for professional practice, build confidence in networking, and enhance employability skills. As Rebecca Rochon writes in her thesis, such teaching practices in

the UK were promoted by an employability initiative in 2019, which sought to ‘embed some form of work-related experiential learning in every course.’⁷ In response, employability has been ‘delivered through collaboration with external partners and employers or through internal mechanisms such as simulation and live briefs.’⁸ As Rochon found, work-related experiences are valuable for students who, in Rochon’s research, ‘...valued authentic learning within a supported environment that live briefs provided.’⁹ While I acknowledge the relevance and importance of such initiatives, this paper explores work opportunities that focus on collaborative and relational forms of employment, rather than those based on more transactional models.

NEOLIBERAL CONTEXT

To give a wider socioeconomic background to employability initiatives in universities, neoliberal narratives can explain trends toward privatisation and competition in economics. Neoliberalism is both a strategy and ideology that takes many forms. Its root can be traced to the Enlightenment period, as Stuart Hall succinctly states: ‘Economically, neo-liberalism’s foundations lay in the rights of free men ‘masters of all they survey and captains of their souls’ to dispose of their property as they saw fit, to ‘barter and truck’, as Adam Smith put it, to make a profit and accumulate wealth, consulting only their own interests.’¹⁰ According to author and activist George Monbiot, ‘Neoliberalism sees competition as the defining characteristic of human relations. It redefines citizens as consumers, whose democratic choices are best exercised by buying and selling, a process that rewards merit and punishes inefficiency.’¹¹

On an individual level then, neoliberalism promotes the self-interest of each worker, and as a group, we are in competition with each other.

Although HE institutions have always educated students for work and industry, in recent years, universities have become ‘sites for economic production itself, engines of economic growth that power the economy by creating knowledge products for private sector growth.’¹² Educators are aware that ‘knowledge production for private enterprise,’ limits quality learning, critical thinking, and innovation by repetitively teaching systematic frameworks of knowledge that support dominant economic priorities and values. This is partly due to the current expectation that universities are required to be ‘value for money’ and to ensure students find employment that pays off student loans and accumulated interest. This approach:

‘...sits at odds with academic principles of ‘realise ourselves as political subjects through theoretical investigation and discussion, but also through projects that forge collaborative relationships and alliances with community organizations and social movements.’¹³

Considering this critique of neoliberal approaches in HE, it is evident that an alternative model of economics is needed to explore the potential of community-engaged projects in creative education.

Poetic Economics

Not only in HE, but in international politics there is a questioning of established financial institutions, and hitherto dominant political parties. Although, economic structures are currently in flux, generally: ‘There is a dawning recognition that a new kind of economy is needed: fairer, more inclusive, less exploitative, less destructive of society and the planet.’¹⁴ As an alternative, what has been termed the ‘social-ecological economy’ by economist Karl William Kapp, could be adopted as a way forward. In his book written in 1950, *The Social Costs of Private Enterprise* (fig.4) Kapp wrote: ‘They leave out of account important social costs of production borne by third persons and future generations...’¹⁵ and argued ‘...for a return to the philosophical foundations of economics, a broadening of conceptual foundations, and a transcending of the horizon of contemporary society towards a social economy.’¹⁶

Kapp argued, that although capitalism accumulates wealth, it does not incorporate environmental and social costs, therefore, projections of net profit are skewed.¹⁷

In relation to education, Kapp warned against ‘careerism’ and ‘specialisation’ in education, which limits students to silos of learning and a narrowing of employment options, rather than exploring interdisciplinary learning and the advantages of transferable skills.

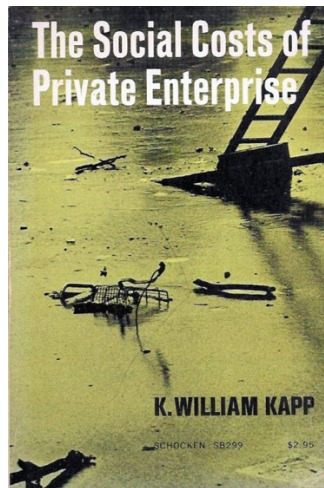


Figure 13. Book Cover of K. William Kapp's The Social Costs of Private Enterprise (1971 [1950])

Another term for social-ecological economics might be ‘poetic economics,’ which explores how poetry can enable a refocusing on ‘...creativity and imagination, nurtures human wisdom and the care for the Self, and values truth over money with a view to deliberate socio-ecological goals.’¹⁸ Building on this, Robert Filliou, a French artist of the Fluxus movement—an avant-garde group that formed in the mid-twentieth century and still continues—discussed poetic economics as ‘...a form of creative investigation and participation.’¹⁹ Similarly, the illustration projects discussed in this paper demonstrate how creative investigation and participation can guide students to experience professional practice in a relational capacity, rather than one associated with the anachronistic view of the discipline as a commercial art.

SHIFTING ROLES: AN EXPANDED PRACTICE

Following economic change, particularly since the 2008 downturn, illustration has expanded on its disciplinary heritage of primarily operating as a commercial practice, to encompass a wider range of applications. As illustrator and academic Luise Vormittag writes:

‘Traditional models for operating as a commercial illustrator are being affected by a rapidly changing media landscape and a reduction in commissioning budgets. Illustration as a discipline can use this time of financial uncertainty and change to reflect upon related fields in the creative industries and as well as referring back to its own core values, skills and objectives.’²⁰

By adapting to this new professional landscape, illustrators are being led to consider their roles as visual communicators more broadly and to take an entrepreneurial approach to applying their skills and finding work. As illustrator-researchers Rachel Gannon and Mirielle Fauchon reflect: ‘Illustrators are increasingly autonomous in identifying professional opportunities and actively seeking out markets and contexts for their practices.’²¹ Such markets and contexts include selling work online and at fairs, setting up web-based subscriptions in which subscribers pay a regular fee to be sent new work, online teaching, and working in healthcare and community settings to run workshops.

In academia, illustrator-researchers and -educators engage in research projects that often expand on the definition of illustration practice and propose innovative processes and applications for the discipline. As illustrator-academics, both teaching staff and students are concerned with how illustration practice interacts with an audience, how to identify and contest systematic inequalities and how to work to create work that fairly represents society. Contemporary illustration teaching critiques the ways in which practitioners communicate within social and cultural contexts:

‘Audiences exist in real-world contexts... illustration is inclusive, people-orientated and able to operate in everyday, social life... research methods often involve direct engagement with the social world.’²²

As illustration is involved in the social world, illustrators are in an optimal position to explore their understanding of visual literacy and image-making skills in relation to community-engagement, shared experiences, and place-making.²³

COMMUNITY-ENGAGED ILLUSTRATION PROJECTS

The projects undertaken by MA illustration students that inform the ideas in this paper involved discussions with archivists, project managers, volunteers, workshop leaders, and members of communities. At the Waterways Museum, students were invited to explore the history of folk art on the canal (fig 5). In the artefacts and documents consulted in the archive, students noted the passion and pride of the eighteenth century working-class who lived and worked on the canals. Motifs and colours of the canal-barges and domestic items such as water jugs were combined to create designs that celebrated canal life, before trains rendered the transport of goods by inland waterways obsolete.



Figure 14. Photos of screen-printed banners made by MA illustration students on display at the Waterways Museum as part of the Folk for Folk exhibition in 2024

The second project was with Hundred Heroines Photography archive, which also involved students handling artefacts, as well as viewing gallery displays. The aim of this project was to design and illustrate posters that celebrated the work of German photographer Elisabeth Buchmeyer Lewis who worked in the UK, and whose archive is held at Hundred Heroines. Students worked with staff and volunteers to develop their impressions and knowledge of the impact of Buchmeyer Lewis's work, and to share what was individual and significant about her work as a woman photographer in the mid-twentieth to early twenty-first century. The project resulted in each student creating a risograph-printed poster, which was then displayed near to the gallery in the Eastgate Shopping Centre in Gloucester (fig.6).



Figure 15. Posters on Display in the Eastgate Centre, Gloucester in 2024

The third project was with The Folk of Gloucester and involved exploring the Tudor buildings that once housed the folk museum, and which still holds many artefacts that memorialise Gloucester's social and industrial past. The buildings are now a Community and Heritage centre that hosts a variety of events, activities, and creative groups. On trips to The Folk, illustration students worked with the staff, volunteers and members of the *Exploring Textiles* group led by artist Ally Goff, to explore what the space meant to the community (fig. 7). This research was then synthesised into designs for tote bags for The Folk, which were made to be sold to raise funds to support of events held at the venue. The students also had the opportunity to demonstrate the process of screen print, and to support members of the group to make their own screen-printed tote bags using paper stencils (fig.8).



Figure 16. screen print design by Jo Howe (left) and Zuza Sek (right) 2025

The three projects briefly outlined above provided the illustration students with opportunities to learn about the wider local community and to engage with the heritage of the area, as well as to share their specialist expertise with new audiences. In terms of professional practice, students reported feeling more confident to organise and run their own workshops and some said they were considering teaching as part of their practice after collaborating with community and heritage organisations. The projects revealed possibilities for in-person and community-engaged projects, that perhaps students would not have considered when focusing primarily on gaining employment within the creative industries or freelancing. As a result of working with community-engaged projects, graduates of the

course have found professional opportunities in areas such as art in healthcare,²⁴ community projects, and residencies that engage with the public as part of their practice.²⁵

WHAT IS LEARNED

Through community-engaged projects, students learn the value of their skills outside of an educational context, where engagement with art may be less accessible for the public, and where some may not believe that they have the ability to be creative. When students have the opportunity to skills-share in community settings, they experience the potential art-making has to bring people together and to augment common experiences. Arts educator Elif Ucan describes learning with a public engagement component as ‘an entry point into the world and invites learners to practice engaging with their communities and society in a broader sense.’²⁶ This is important as it offers learners the opportunity to ‘...raise their civic voice can help them gain a deeper understanding of ‘otherness’ and of how working together in society can establish and secure a stronger, equitable society where voices are represented and heard.’²⁷ Through these projects, students benefit from a newfound confidence to consider collaborations with community and heritage organisations as part of their practices, which offers opportunities to explore stories and history through image-making.

Furthermore, creative students learn from direct experience that their skills, work, and ideas are appreciated in society and that they bring enjoyment, challenge, and curiosity. These approaches reflect Beger’s thoughts on poetic economics that incorporate ways of knowing that are not linear or prescribed but that encourage students to ‘find out for themselves’ through ‘story-telling, rhetoric, hermeneutics and experiential knowledge.’²⁸ In turn, communities gain from learning new skills, engaging in discussion of their memories and interests, and exploring expressing their ideas through visual art, supported by the students.



Figure 17. Skills-sharing screen print process at The Folk of Gloucester

A connection between poetic economics and pedagogy can be found in the approaches of Learning for Sustainability (LfS) which ‘...aims to engage learners in action, to be critical of accepted norms and to empower learners to make a difference in the world.’²⁹ In these final paragraphs, I draw upon the research of doctoral candidate Eleftheria Lakovidou to explain how an ethos of poetic economics, or Kapp’s social-ecological approach, can be applied to teaching in the arts, and potentially, across subject areas.

In LfS, students are supported to challenge their viewpoints, face the complexities of society and environmental issues, and address unpredictable futures.³⁰ Art education broadly enables students to share ideas, give and receive feedback, and to embed experiences to shape their individual practices within group dynamics. By learning collectively, students encounter pluralistic views through sharing concepts, skills, and knowledge within creative communities both within and external to educational

contexts (fig.9). As Berger argues, creative thinking gives rise to new thought that does not depend on single established views of reality. The danger of not enabling original thought is that we do not see what is coming, such as economical or environmental breakdown.³¹



Figure 18. Discussion of community quilt at The Folk of Gloucester

The purposes of teaching by collaborating with heritage organisations and communities, is to create an alternative way of viewing illustration practice and to expand employment options for students, as well as to recognise the value their creative skills and ideas, in an economic environment which does not always support artists. In line with the objective of poetic economics, ‘this approach invites us to consider not just what is profitable, but what is possible when we bring our full creative potential to bear on our economic challenges.’³²

CONCLUSION

In conclusion, for the reasons outlined in this paper, community-engaged projects in educational settings can enable students to contemplate their work in a constellation of viewpoints and experiences, which moves away from individualistic working practices. Although the current economic situation is uncertain, and technological advances cause concern for the longevity of careers in the creative industries, experiences such as working with heritage and community organisations can help to reframe illustration practice, and to shape how it can co-exist with technological shifts in meaningful ways.

Creating art with and for the public brings to the fore creativity as an embodied and experiential learning process. Although at times the precarity of creative work can cause anxiety, especially for current students and recent graduates, such conditions offer opportunities for positive change through a repositioning of the functions of creative practice. As Rebecca Solnit writes:

‘Social, cultural, or political change does not work in predictable ways or on predictable schedules...We don’t know what is going to happen, or when, and that very uncertainty is a space of hope.’³³

To give students the best opportunity to navigate uncertain futures, educators can teach using approaches defined by LfS, which acknowledge uncertainties, while finding certainties within in-person interactions, local communities, and shared experiences. In this way, students can form their own visions for a future that encompasses a pluralistic way of living, rather than individualistic models that do not serve social or environmental spheres.

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THE SHIP OF GPT: AUTHORSHIP, AUTHENTICITY, AND THE CHANGING AESTHETICS OF AI-GENERATED ART

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INTRODUCTION

The classroom has long been a space where questions of art, identity, and authorship are debated through theory, critique, and historical precedent. With the emergence of generative artificial intelligence, however, these questions are no longer abstract. They are enacted daily in studios, classrooms, and assessment practices. Students now produce visually sophisticated work using AI systems capable of replicating stylistic gestures, compositional logic, and painterly textures once associated exclusively with human labor. This development confronts educators with an urgent pedagogical dilemma: when creative execution is partially or fully delegated to machines, what does it mean to author a work, and how should learning be assessed?

This study examines how authorship and authenticity are perceived when a human artwork is progressively transformed through generative AI, and how these perceptions expose a fault line between craft-based models of art education and emerging concept-driven, AI-augmented creative practices. Framed through the philosophical paradox of the Ship of Theseus,¹ the study asks a deceptively simple question: if an artwork's material form is gradually replaced by algorithmic generation, at what point does it cease to belong to its original creator?

Applied to art, the Ship of Theseus raises questions about whether authorship resides in material execution, conceptual intent, narrative continuity, or social recognition. Philosophical accounts reinforce this ambiguity. Barthes' "death of the author" destabilized singular creative ownership,² while Danto's Artworld theory argued that meaning is shaped by interpretive context rather than material form alone.³ Together, these perspectives position authorship as a negotiated construction rather than a fixed property.

These tensions gain renewed urgency with generative AI. Systems such as Stable Diffusion and DALL·E simulate painterly gestures and recombine stylistic histories, producing outputs often indistinguishable from human-made work.⁴ This resemblance challenges assumptions about originality, effort, and authorship that underpin both artistic practice and educational assessment.

Empirical research confirms that authorship judgments depend strongly on perceived process. Epstein et al.⁵ show that evaluations of AI-generated art decline when audiences believe the work results from autonomous computation, even when aesthetic quality remains high. This finding is central to the present study, which demonstrates that authorship attribution is shaped less by visual outcome than by beliefs about production.

Historical precedent further contextualises this moment⁶. As Hertzmann argues, generative AI parallels the introduction of photography, which was initially dismissed as mechanical reproduction because it replaced the artist's hand.⁷ Over time, authorship shifted toward framing, intention, and conceptual decision-making. Similarly, AI replaces rendering while redistributing authorship toward conceptual direction, prompt design, and curatorial judgement.

Resistance to AI-generated art remains strong, particularly among trained practitioners. Phenomenological accounts emphasize embodied gestures and material struggle as markers of authenticity.⁸ When AI simulates these gestures without bodily effort, works may remain visually compelling yet be perceived as ontologically hollow. Psychological studies by Millet et al. and Chiarella et al. further identify a robust anthropocentric bias: individuals devalue creative outputs when they believe the origin is non-human, even while acknowledging aesthetic quality.⁹

Within educational contexts, these dynamics create a significant challenge. Art and design pedagogy has traditionally relied on visible labor, technical mastery, and process documentation as indicators of learning. Generative AI destabilizes all three by decoupling output quality from execution time and embodied effort. As students increasingly work with AI as creative partners, assessment models grounded primarily in execution risk misaligning evaluation with actual learning.

Despite growing policy discourse, there remains limited empirical research connecting perceptions of AI authorship to actionable pedagogical frameworks. Most studies treat AI authorship as a binary distinction rather than a continuum. This study addresses that gap by modelling authorship as gradual replacement, identifying perceptual tipping points, and comparing student and professional judgments. The Ship of GPT framework proposed here reframes authorship as a teachable and assessable construct—centered on conceptual intent, process transparency, ethical judgement, and reflective engagement—positioning generative AI not as a threat to creative education, but as a catalyst for rethinking what it means to learn, teach, and author in the age of intelligent tools.¹⁰

METHODS

Design and Rationale

A mixed-method, within-subjects experimental design was employed. Each participant viewed four derivative images derived from *Starry Night* with increasing algorithmic substitution (10%, 50%, 75%, 100%). After each image participants rated four single-item scales and provided open-ended justifications. The within-subjects format offers clear comparison across replacement levels and allows us to tie perceptual shifts to pedagogical meaning.

Participants

N = 202 participants: 162 students (design/art/communication) and 40 professionals (artists, designers, educators). Recruitment combined classroom cohorts and invited professionals. Ethics approval and informed consent were obtained.

Stimuli and AI Generation

Four derivatives were generated via a reproducible pipeline using Stable Diffusion v1.5 (inpainting/masked replacement for 10% and 50%) and DALL·E 3 (larger restylizations and full generation for 75% and 100%). Operational definitions:

- **10%** — Localized micro-inpainting (strength ≈ 0.12); small texture patches replaced.
- **50%** — Masked inpainting approximating half of visible pixels (strength ≈ 0.48).
- **75%** — Large-region stylization via latent diffusion preserving global composition.
- **100%** — Full text-to-image synthesis; no original pixels retained.



Figure 1. Progressive AI replacement of Starry Night: original artwork (top left), 10% AI derivative (top right), 50% AI derivative (bottom left), and 100% fully AI-generated version (bottom right)

Measures

Participants rated each image on 7-point Likert scales:

1. Authorship Attribution — “This artwork still belongs to Van Gogh.”
2. Authenticity — “This feels like an authentic work of art.”
3. Aesthetic Appeal — “This version is visually appealing.”
4. Emotional Resonance — “This artwork evokes emotions in me.”

Open-ended justifications (≤ 200 words) followed each rating.

Analysis

Quantitative: descriptive statistics, repeated-measures mixed-model ANOVA (within: replacement level; between: group), Greenhouse–Geisser corrections when necessary, Bonferroni post-hoc contrasts, paired t-tests, Pearson correlations. Effect sizes reported as partial η^2 .

Qualitative: iterative thematic coding (two coders; 20% double-coded; Cohen’s $\kappa > 0.78$). Themes aggregated into three interpretive camps: Origin, Execution, Aesthetic.

RESULTS

Overview and Key Patterns

All 202 participants completed all conditions. The central quantitative pattern is a sharp decline in Authorship and Authenticity between 10% and 50% AI replacement, and further decline beyond 50% with saturation after 75%. **Aesthetic Appeal** declines more moderately and remains above neutral for most participants. Professionals show a much steeper decline in authorship attribution than students.

Metric	10% AI (M $\pm$ SD)	50% AI (M $\pm$ SD)	75% AI (M $\pm$ SD)	100% AI (M $\pm$ SD)
Authorship	6.55 $\pm$ 0.72	4.67 $\pm$ 1.85	3.51 $\pm$ 1.95	3.22 $\pm$ 2.01
Authenticity	6.48 $\pm$ 0.79	4.35 $\pm$ 1.89	3.19 $\pm$ 1.83	2.89 $\pm$ 1.76
Aesthetic Appeal	6.21 $\pm$ 0.94	5.38 $\pm$ 1.35	5.04 $\pm$ 1.34	4.81 $\pm$ 1.41
Emotional Resonance	5.80 $\pm$ 1.13	4.79 $\pm$ 1.54	4.09 $\pm$ 1.58	3.85 $\pm$ 1.63

Table 1. Mean (M) and standard deviation (SD) of authorship, authenticity, aesthetic appeal, and emotional resonance across AI replacement levels (N = 202)

Group-wise Trends (Students vs Professionals)

Table 2 presents group-specific means.

Metric	Group	10% AI	50% AI	75% AI	100% AI
Authorship	Students	6.57 ± 0.70	5.15 ± 1.65	4.11 ± 1.71	3.88 ± 1.78
	Professionals	6.48 ± 0.81	2.76 ± 1.72	1.15 ± 1.21	0.89 ± 1.11
Authenticity	Students	6.50 ± 0.78	4.78 ± 1.70	3.62 ± 1.60	3.28 ± 1.55
	Professionals	6.41 ± 0.86	2.51 ± 1.71	1.02 ± 1.04	0.84 ± 0.96
Aesthetic Appeal	Students	6.24 ± 0.92	5.47 ± 1.28	5.13 ± 1.30	4.92 ± 1.39
	Professionals	6.05 ± 1.02	5.01 ± 1.51	4.64 ± 1.47	4.29 ± 1.44

Table 2. Mean (M) and standard deviation (SD) of selected perceptual metrics by participant group (students vs professionals) across AI replacement levels

Interpretation: Professionals sharply reduce attribution already at 50% AI replacement (mean ≈ 2.76), while students remain closer to the midpoint (mean ≈ 5.15). This group divergence is central to pedagogical interpretation: student responses privilege conceptual continuity, professionals privilege embodied execution.

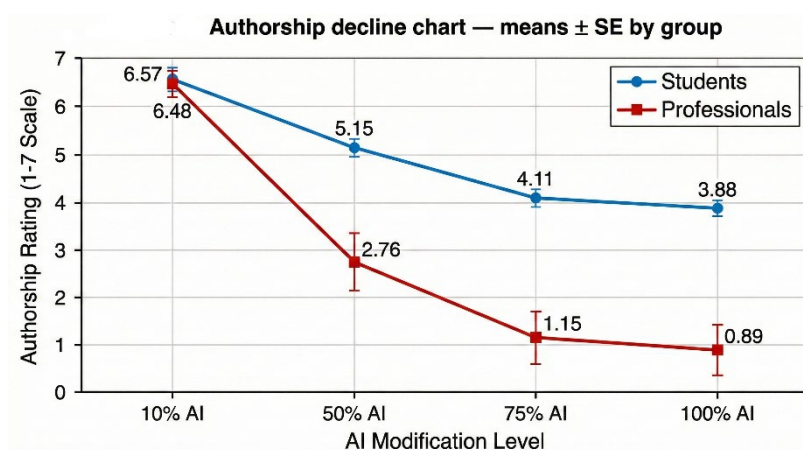


Figure 2. Mean authorship attribution ratings ($\pm$ SE) across AI Replacement levels for students and professionals

Inferential Statistics: Mixed-Model ANOVA

Assumption checks: Shapiro–Wilk indicated approximate normality (aggregated checks), Mauchly’s test indicated violation of sphericity for Authorship and Authenticity ($\chi^2(5)=21.84$, $p<.001$) — Greenhouse–Geisser corrections applied. Levene’s tests non-significant for between-group comparisons.

Metric	F (corrected df)	p	Partial η^2
Authorship	F(2.41, 482.3) = 263.44	< .001	.57
Authenticity	F(2.41, 482.3) = 284.76	< .001	.61
Aesthetic Appeal	F(3, 600) = 59.17	< .001	.22
Emotional Resonance	F(3, 600) = 74.82	< .001	.27

Table 3. Repeated-measures mixed-model ANOVA results for perceptual metrics across AI replacement levels (Greenhouse–Geisser corrected)

Interpretation: Replacement level has a **very large** effect on Authorship and Authenticity (partial η^2 .57–.61) and a moderate effect on Aesthetic Appeal (.22). Post-hoc Bonferroni contrasts: significant pairwise differences between 10%→50% and 50%→75% for Authorship and Authenticity ($p<.001$); differences between 75%→100% are smaller and often non-significant (saturation effect).

Correlations and Decline Comparisons

	Authorship	Authenticity	Aesthetic Appeal	Emotional Resonance
Authorship	1.00	.89	.41	.62
Authenticity	.89	1.00	.38	.59
Aesthetic Appeal	.41	.38	1.00	.78
Emotional Resonance	.62	.59	.78	1.00

Table 4. Pearson correlation coefficients among authorship attribution, authenticity, aesthetic appeal, and emotional resonance (pooled sample)

Paired t-test (decline magnitude): Authenticity decline (10%→100% $\Delta = 3.59$) vs Aesthetic Appeal decline ($\Delta = 1.40$): $t(201) = 15.82$, $p < .001$. Authenticity deteriorates significantly faster than aesthetic appreciation.

Distributional Patterns and Bimodality

Authorship at 100% AI displays a bimodal distribution consistent with three interpretive camps.

Rating	% of responses	Interpretation
1 (Strongly disagree)	31.7%	Execution Camp (reject authorship)
2–3	20.1%	Strong skepticism
4 (Neutral)	12.1%	Ambivalence
5–6	10.9%	Moderate attribution
7 (Strongly agree)	1.5%	Conceptual purists

Table 5. Distribution of authorship attribution ratings at 100% AI replacement illustrating emergent interpretive response patterns

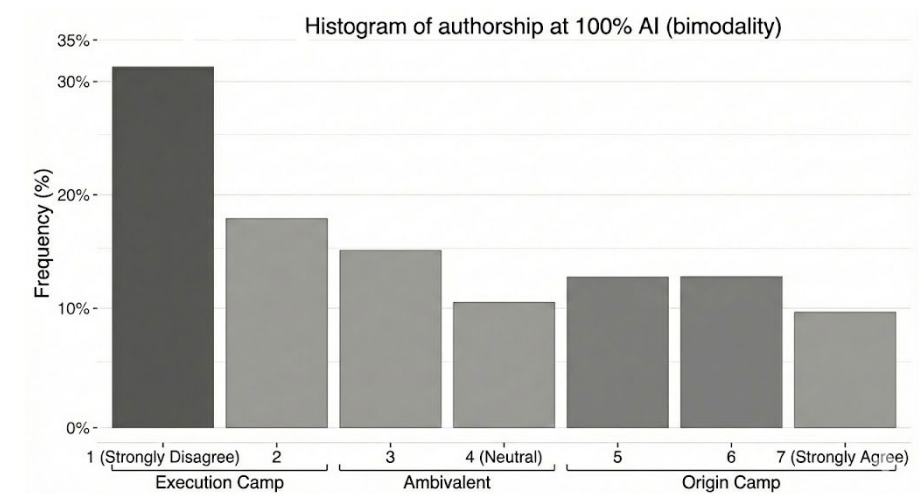


Figure 3. Distribution of authorship attribution ratings at 100% AI replacement illustrating bimodal response pattern

Qualitative Themes

Iterative coding produced the three major camps:

- Origin Camp (~40%) — Conceptual continuity: the idea remains even if the hand is absent.
- Execution Camp (~35%) — Embodied craft is decisive: the absence of hand equals absence of authorship.
- Aesthetic Camp (~25%) — Separates visual pleasure from authorship: “It’s beautiful but not authentic.”

Representative quotes are included in Supplementary Materials.

PEDAGOGY-ORIENTED ANALYSES AND NEW TABLE FORMATS

To translate the empirical findings into educationally actionable knowledge, I created pedagogical indices and tables that recast perceptual change as learning-related constructs. Each index uses the same data but reframes results for instructors, curriculum designers, and assessment policymakers.

Pedagogical Sensitivity Index (PSI)

Definition: PSI quantifies how sensitive a group is to AI replacement in terms of perceiving authorship loss. Calculated as the normalized mean change (10%→50%→100%) in authorship ratings per group.

Group	Authorship 10%	Authorship 50%	Authorship 100%	PSI Score (0–1)*
Students	6.57	5.15	3.88	0.41
Professionals	6.48	2.76	0.89	0.86

Table 6. Pedagogical Sensitivity Index (PSI) quantifying authorship attribution decline across AI replacement levels by participant group

*PSI calculated as (mean decline / maximum possible decline 6) scaled 0–1. Higher = greater sensitivity.

Interpretation: Professionals (PSI .86) are far more pedagogically sensitive to AI substitution than students (.41). For educators, this suggests curricula need differentiated approaches: students may not perceive AI substitution as a threat to authorship and will require scaffolded learning to attend to embodied craft signals or ethical/provenance issues.

Cognitive Divergence Index (CDI)

Definition: CDI measures the absolute difference between student and professional ratings at each condition — a classroom-relevant measure of expectation mismatch.

Condition	Students (Authorship)	Mean	Professionals (Authorship)	Mean	CDI (absolute diff)
10%	6.57		6.48		0.09
50%	5.15		2.76		2.39
75%	4.11		1.15		2.96
100%	3.88		0.89		2.99

Table 7. Cognitive Divergence Index (CDI) showing absolute differences between student and professional authorship ratings across AI replacement conditions

Interpretation: CDI grows markedly after 10%; greatest divergence occurs at 100% (CDI ≈ 2.99). In classrooms where students and practicing professionals interact (crit juries, guest critiques),

expectation mismatch can create confusion. This suggests explicit calibration activities (rubrics, framing) are necessary.

Attribution Stability Table (AST)

Definition: Which evaluation dimensions are stable (robust to AI replacement) versus volatile. Calculated by relative percentage decline (10%→100%) per metric.

Metric	10% score	100% score	Absolute decline	% decline of baseline
Authorship	6.55	3.22	3.33	50.9%
Authenticity	6.48	2.89	3.59	55.4%
Aesthetic Appeal	6.21	4.81	1.40	22.6%
Emotional Resonance	5.80	3.85	1.95	33.6%

Table 8. Relative stability and volatility of perceptual dimensions across progressive AI replacement (percentage decline from 10% to 100%)

Interpretation: Authorship and Authenticity show >50% decline (volatile); Aesthetic Appeal is relatively stable (~23% decline). Pedagogically, assignments that treat aesthetics as the primary outcome may be less sensitive to AI substitution than those that aim to measure authorship-based competencies.

Threshold Identification Table (TIT)

Definition: The empirically observed point where at least 50% of professionals (or students) shift from attribution to rejection.

Group	Threshold Level (where ≥50% move to non-attribution)
Professionals	~50% replacement (majority reject)
Students	~75–100% replacement (gradual shift; majority still attributing at 50%)

Table 9. Empirically observed AI replacement thresholds at which majority attribution shifts occur for each participant group

Interpretation: 50% replacement is a pedagogically meaningful threshold for professionals. For student assessment, the threshold is higher — thus educators must be deliberate when designing tasks that rely on embodied execution as an outcome: using the 50% threshold as a policy cutoff for “authentic manual work” may unfairly penalize students who focus on concept/prompt craft.

Qualitative Theme Frequency (Pedagogical mapping)

Theme	Frequency (%)	Pedagogical Interpretation
Prompting as craft	28%	Teach prompt engineering as a studio skill; include reflective logs.
Embodied skill / craft	33%	Maintain hands-on modules to preserve embodied literacy.
Concept over execution	22%	Emphasize ideation, concept articulation, and documentation.
Ethics / provenance	12%	Introduce ethics and documentation modules (metadata, prompts).
Mixed / unsure	5%	Use scaffolded critique to clarify expectations.

Table 10. Frequency of qualitative themes and corresponding pedagogical interpretations

Interpretation: Roughly one-third emphasize embodied craft, another substantial portion (≈28%) regard prompting as a new craft. A balanced curriculum should therefore teach both competencies.

DISCUSSION — PEDAGOGICAL INTERPRETATION

The quantitative results show a robust perceptual effect: **Authorship** and **Authenticity** decline precipitously as algorithmic substitution increases, with professionals reacting earlier and more strongly than students. The pedagogy-focused reframing yields three principal takeaways.

Takeaway 1 — Assessment must be recalibrated toward *process and evidence*

If educators continue to assess manual technique using product-based rubrics without requiring provenance evidence, students can use AI to produce visually successful artifacts while bypassing embodied learning targets. Practical response: require process artifacts — time-lapse videos, annotated prompts, mask files, code, and reflective logs — as part of assessment. This ties the work to demonstrable learning activities rather than solely to final appearance.

Takeaway 2 — Design curricula to teach *dual literacies*: embodied craft + prompt literacy

Teaching must now explicitly include prompt design, model literacy (caps, biases, reproducibility), and ethical use, alongside foundational studio practice. The PSI and CDI tables show professionals value embodiment; to bridge the gap, programs can sequence learning: fundamentals of craft → introduction to generative tools as augmentation → assessment blending both literacies.

Takeaway 3 — Use graded disclosure and pedagogical labeling

Given the perceptual threshold at ~50% AI replacement (for professionals), instructors should require transparent labeling of AI contribution in student submissions. This can be taught as a professional practice: archiving seeds, prompts, masks, and versions as part of the project dossier. Doing so cultivates reflective practice and prepares students for ethical exhibition.

Takeaway 4 — Rethink learning outcomes and rubrics

Outcomes that previously rewarded high execution finesse (e.g., mark for “brushwork mastery”) must be reformulated. New/outcome examples:

- “Can the student articulate the conceptual choices and procedural steps used to generate the final image?”
- “Can the student demonstrate prompt iteration and justify decisions in relation to intended affect?”
- “Can the student show ethical reasoning regarding dataset provenance and model training implications?”

Rubric designers should convert single-point product rubrics into multi-dimensional rubrics that weigh process, provenance, and reflective critique¹¹.

PRACTICAL IMPLICATIONS FOR TEACHING PRACTICE & CURRICULUM DESIGN

Course-level

- Studio Foundations (Level 1): preserve hand-based modules; make AI optional, used only for experimentation.
- Intermediate (Level 2): require both manual studies and AI-driven projects; assess process artifacts for both.
- Advanced / Capstone (Level 3/4): emphasize hybrid practice: students must present both a manual original (sketches, studies) and a generative extension with full documentation.

Assessment policy

- Introduce a “**Provenance Appendix**” in submissions: a mandatory section where students attach prompts, seeds, masks, and explanation of workflow. Mark for quality of documentation and reflective interpretation.
- Include **peer-crit rubrics** that train students to critique both concept and process rather than merely work surface.

Institutional & professional development

- Offer staff development workshops on generative AI tools to align teacher and professional expectations (reducing CDI).
- Create policy guidance for exhibitions and archives on how to present algorithmic contribution.

LIMITATIONS AND FUTURE WORK

- **Generalizability:** The study uses one canonical painting (*Starry Night*). Effects may differ with less canonical or culturally distant images.
- **Sequencing effects:** Fixed order (10%→100%) could create anchoring or contrast effects; counterbalanced designs would reduce this.
- **Single-item scales:** Practical constraints favored single-item measures; future work should use multi-item validated scales (e.g., perceived authenticity scales).
- **Physiological measures:** Future studies could incorporate eye-tracking or EEG to probe implicit processing differences.
- **Cluster analysis:** A formal k-means follow-up on interpretive camps is recommended (we provide a conceptual partition in the Appendix).

CONCLUSION

For educators, the central evidence-based claim is this: **generative AI preserves appearance but transforms perceived authorship and authenticity** — with significant pedagogical consequences. The 50% substitution threshold is a practical marker: beyond it, many practitioners (and an increasing share of students) will no longer perceive the work as belonging to the original maker. Education must adapt: teach dual literacies (craft + prompt), demand provenance, revise rubrics, and scaffold reflective critique. The Ship of GPT thus becomes not just a research metaphor but a curricular imperative: to teach how to make, how to document, and how to think ethically about what we call art in the age of generative systems.

NOTES

- ¹ David Wiggins, *Sameness and Substance* (Oxford: Blackwell, 1980).
- ² “Barthes’ ‘death of the author’ Roland Barthes, “The Death of the Author,” *Aspen* no. 5–6 (1967): 142–148.
- ³ Arthur C. Danto, “The Artworld,” *The Journal of Philosophy* 61, no. 19 (1964): 571–584, <https://doi.org/10.2307/2022937>.
- ⁴ Joanna Zylińska, *AI Art: Machine Visions and Warped Dreams* (London: Open Humanities Press, 2020).
- ⁵ Ziv Epstein et al., “Art and the Science of Generative AI,” *Science* 380, no. 6650 (2023): 111–114, <https://doi.org/10.1126/science.ade5937>.
- ⁶ Walter Benjamin, “The Work of Art in the Age of Mechanical Reproduction,” in *Illuminations*, trans. Harry Zohn (New York: Schocken Books, 1968), 217–252.
- ⁷ Aaron Hertzmann, “Can Computers Create Art?” *Arts* 7, no. 2 (2018): 18, <https://doi.org/10.3390/arts7020018>.
- ⁸ Paul Crowther, *Phenomenology of the Visual Arts (Even the Frame)* (Stanford, CA: Stanford University Press, 2009).
- ⁹ Guillaume Millet et al., “Defending Humankind: Anthropocentric Bias in the Appreciation of AI Art,” *Computers in Human Behavior* 139 (2023): 107493, <https://doi.org/10.1016/j.chb.2022.107493>; Giulia Chiarella et al., “Investigating the Negative Bias toward Artificial Intelligence,” *AI & Society* 37, no. 3 (2022): 903–917, <https://doi.org/10.1007/s00146-021-01257-2>.
- ¹⁰ Donald A. Schön, *The Reflective Practitioner: How Professionals Think in Action* (New York: Basic Books, 1983).
- ¹¹ Mark Fisher and David Elgan, “AI-Generated Art and the Ethics of Authorship,” *Leonardo* 56, no. 2 (2023): 131–138, https://doi.org/10.1162/leon_a_02118.

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FROM OBSERVATION TO IMPLEMENTATION: A PEDAGOGICAL FRAMEWORK FOR FORM STUDIES IN DESIGN EDUCATION

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INTRODUCTION

Form Studies has long been part of design education. Traditionally, it has focused on visual inquiry, proportion, composition, and aesthetic sensitivity. In studio teaching, students often begin by observing, sketching, and analyzing form to develop visual judgement. These practices remain important. However, current design practice increasingly expects form to do more than look visually pleasing. Form now carries meaning, identity, and emotion. In product and transportation design, form often communicates intent and character even before a user interacts with function. In this sense, form becomes a bridge between designer intention and user perception.

In practice, form is shaped by multiple factors. Engineering constraints, materials, cultural context, digital tools, and user experience all influence how form is developed and perceived. For this reason, design education needs to move beyond surface-level form exploration. Students need structured ways to interpret and implement form as an experiential and communicative system. Cross's concept of "designerly ways of knowing" positions making and visual exploration as central epistemic activities in design, providing a pedagogical rationale for studio-based learning environments where knowledge is constructed through iterative visual and material exploration.¹

Despite its importance, Form Studies is often disconnected from later studio projects. Abstraction exercises are frequently taught as isolated tasks, and students struggle to carry these insights into product design. Recent research in design education points to this fragmentation, where abstraction and implementation are taught separately rather than as a continuous learning process.² When this happens, perceptual and emotional intent developed during early exercises is often lost when students move toward functional design outcomes.

This paper proposes a two-stage pedagogical framework for Form Studies. The first stage, Abstraction, focuses on observing, decoding, and extracting formal and emotional vocabulary. The second stage, Implementation, focuses on translating this vocabulary into product-oriented contexts using sketching, modelling, material exploration, and digital tools. Rather than treating these stages as linear, the framework treats them as an iterative loop, where insights from one stage inform the other. The study is grounded in a practice-based pedagogical inquiry. It examines how structured studio teaching can support perception, interpretation, and implementation while aligning foundational learning with contemporary professional practice. By combining experiential learning, reflective

practice, and perceptual theory with recent design pedagogy research, this paper offers a framework for strengthening Form Studies in design education.

Why Form Still Matters

Form as a Communicative and Experiential Construct

From a semiotic and Semantic perspective, form functions as a system of signs through which designers encode meaning and users decode intent. Product forms communicate values, identity, usability cues, and cultural narratives through visual and material languages. For example, curvature, proportion, and surface articulation can signal friendliness, precision, robustness, or luxury, shaping user expectations even before interaction occurs.³

Phenomenological theory, particularly Merleau-Ponty's notion of embodied perception suggests that users engage with form through bodily orientation, movement, and sensory experience, making form an experiential interface rather than a static visual object. In design education, this implies that students must learn to perceive form not only as geometry but as lived experience, where perception, movement, and materiality co-constitute meaning.⁴

Pedagogically, teaching form therefore involves cultivating students' interpretive and experiential sensitivity. Studio practices such as observation, abstraction, and narrative mapping support students in recognising how form mediates meaning, emotion, and cultural identity. This aligns with Schön's reflective practice, where designers learn through cycles of seeing, acting, and reflecting, gradually developing an interpretive understanding of how form communicates in context.⁵

Form as a Pedagogical Bridge Between Abstraction and Implementation

Form also remains central in design education because it bridges conceptual abstraction and material implementation. Early abstraction exercises help students develop perceptual awareness and emotional vocabularies, while implementation stages require engagement with materials, ergonomics, manufacturing constraints, and technological systems. Form becomes the thread that connects conceptual thinking with material realisation.

Embodied cognition theory (Lakoff and Johnson) provides a cognitive framework that posits human reasoning is rooted in bodily experience and interaction with the environment. In design education research, this perspective has been used to support studio-based practices such as sketching, modelling, and prototyping as cognitive activities through which designers externalise and refine their ideas.⁶ Sketching, modelling, and prototyping are not merely representational tools but cognitive processes through which designers think with their hands and bodies. In this sense, form functions as a cognitive scaffold that supports learning across representational modes, enabling students to translate perceptual and emotional intent into tangible artefacts.

Treating form as a continuous pedagogical construct—rather than an isolated foundational exercise—supports integrative learning across abstraction, digital modelling, and prototyping. This approach aligns with contemporary design pedagogy, which emphasises iterative cycles of perception, reflection, and making. By foregrounding form as both a conceptual and embodied learning process, design education can better prepare students to negotiate the tensions between expressive intent and functional feasibility in professional practice.

Focus and Scope of the Study

The main focus of this study is to connect abstract form inquiry with real-world implementation in design education. The framework is structured around two linked stages:

1. Abstraction of Form: how students observe, decode, and extract visual and emotional vocabulary from natural, cultural, and industrial references.

2. Implementation of Form: how this vocabulary is translated into sketches, models, and tangible product forms while addressing functional and material constraints.

The study addresses the following objectives:

- To examine how structured studio pedagogy supports continuity between abstraction and implementation.
- To identify cognitive, emotional, and technical challenges in translating abstract form into applied design contexts.
- To evaluate the effectiveness of a two-stage abstraction–implementation framework.
- To explore how hybrid tools and reflective practice help maintain formal and emotional intent across representational modes.
- Faculty perspectives on curriculum sequencing, critique practices, and experiential learning guide this inquiry. Form is treated as a multidimensional construct that emerges through perception, interpretation, and material realization.

Methodology

Research Approach

This study uses a qualitative, practice-based pedagogical inquiry. Studio teaching is treated as both a learning environment and a research setting. The framework draws on experiential learning theory, reflective practice, and perceptual theories of form and meaning.⁷ Recent research in design education also highlights the importance of analyzing learning processes and transitions between representations, which supports the approach used here.

Student sketches, models, critiques, and reflective discussions are treated as qualitative pedagogical evidence rather than statistically generalizable data. This approach is consistent with contemporary design education research that recognizes reflective studio practice as a valid way to study learning.

Stage 1: Abstraction of Form

The first stage focuses on perceptual training and emotional decoding. Students work with natural systems, cultural artefacts, and industrial objects through structured observation exercises. These activities aim to build sensitivity to proportion, rhythm, movement, pattern, and spatial relationships. Lawson argues that sketching and abstraction help designers externalise and restructure how they understand a problem.⁸

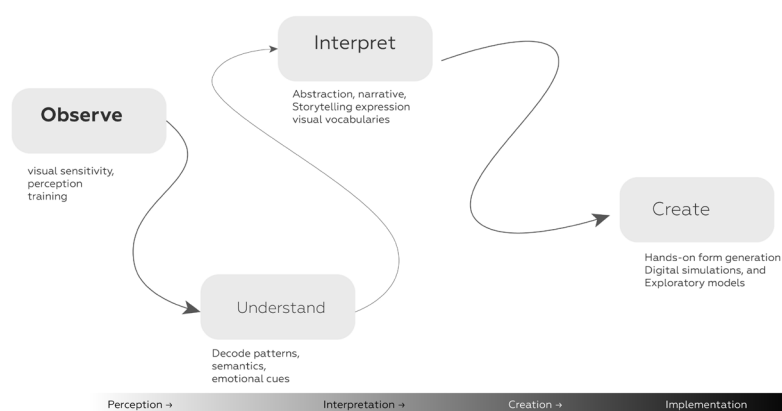


Figure 1. Abstraction of Form framework.

The abstraction process is organised into four phases - as illustrated in Figure 1.

Observation: Students carry out detailed visual scanning, sketching, and diagramming to move beyond first impressions.

Understanding: Students decode relationships, emotional cues, and semantic qualities with guidance from faculty critique.

Interpretation: Observations are translated into abstract narratives and visual vocabularies so that students can articulate formal intent.

Creation: Students produce sketches, digital simulations, and exploratory models to externalise their insights.



Figure 2. cognitive extraction

In this framework, abstraction is not treated as copying visual features. Instead, it is understood as cognitive extraction - as illustrated in Figure 2. This view aligns with perceptual theories of visual thinking and recent work on teaching abstraction in design education.⁹ Schön and Wiggins describe design learning as a process of iterative seeing, where perception and action develop together through reflection.¹⁰

Stage 2: Implementation of Form

The second stage applies the same sequence—observe, understand, interpret, implement—to product contexts. Observation shifts toward existing product languages, ergonomics, and contextual constraints. Students analyse how form functions within cultural, technological, and market contexts. - as illustrated in Figure 3.

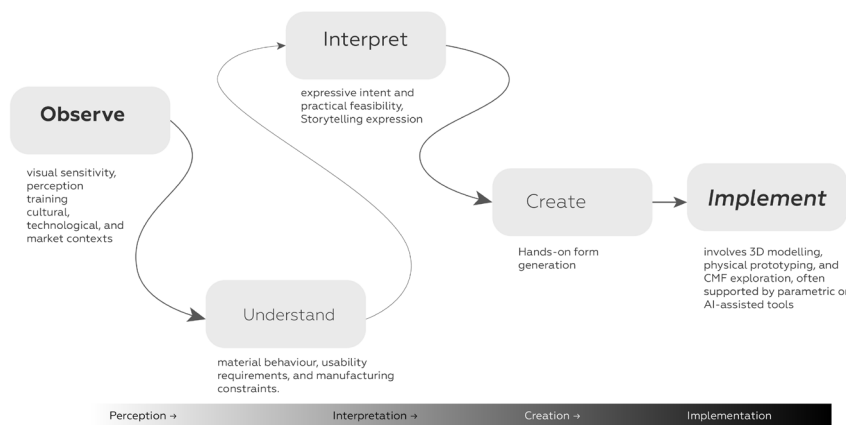


Figure 3. Implementation of Form framework.

Understanding involves identifying material behaviour, usability requirements, and manufacturing constraints. Interpretation requires students to negotiate between expressive intent and practical feasibility, using geometry and proportion to re-express abstract ideas.

In classroom activities, students were guided to extract product-related vocabulary encompassing both functional and formal attributes. A curated image bank comprising products from multiple categories, ranging from legacy artefacts to technologically advanced contemporary products, was presented to support comparative analysis. Through facilitated discussions, students translated visual observations into verbal descriptors, enabling them to articulate and structure their understanding of product form, function, and evolution. This process helped students recognise continuity and transformation in visual language across product generations. The resulting vocabulary bank was subsequently used as a reference framework during the ideation and concept development phases. – as illustrated in Figure 4.



Figure 4. Creating a visual and verbal vocabulary library

Implementation involves 3D modelling, physical prototyping, and CMF exploration, often supported by parametric or AI-assisted tools. Oxman's work on computational design theory highlights a shift from static representation to rule-based generative systems, which has implications for design education by changing how students explore and generate form using parametric and algorithmic tools.¹¹

Recent studies also emphasise the importance of tracking transitions from sketch to digital model to prototype in order to understand how design intent changes.¹² In this study, iterative critique and reflection are built into the process to help preserve emotional and semantic intent across design stages.

Pedagogical Observations

Abstraction: Perceptual and Emotional Learning

Studio observations suggest that students initially viewed form mainly as a visual or structural outcome. Through abstraction exercises, students began to see form as a communicative and emotional construct. Activities focusing on rhythm, proportion, and movement helped students build a shared visual vocabulary and express formal intent more clearly.

Abstraction also presented challenges. Students often struggled to decide what to abstract and how to avoid copying references directly. Many found it difficult to structure intuitive responses into formal narratives. These issues highlight the need for scaffolded sequencing and guided critique. Similar challenges have been reported in recent design pedagogy research on conceptual transfer¹³



Figure 5. structured critique panel and sensory exploration.

To evaluate the final design concepts, a structured critique panel was conducted in which each student presented and discussed their formal expressions and associated emotional cues. Students explained how extracted linear abstractions were transformed into volumetric forms while preserving the underlying visual and emotional vocabulary. They also reflected on the relationship between specific formal characteristics and potential product applications, justifying why particular forms were associated with certain product typologies.

In addition, the abstraction and extraction exercises were extended to master's-level students through a blindfolded sensory exploration activity. Without prior knowledge of the form's visual origin, students used tactile perception to interpret the emotional and volumetric qualities of the forms. Based on these sensorial interpretations, students re-iterated and modified the forms by altering geometric parameters such as corners, fillets, and surface articulations to generate new formal variations. This activity aimed to investigate how embodied sensory perception influences form interpretation and transformation in the design process— as illustrated in Figure 5.

Implementation: Negotiating Expression and Feasibility

Implementation activities revealed tensions between expressive intent and functional constraints. Students developed greater awareness of scale, ergonomics, and material behaviour, but often found it difficult to retain emotional intent when faced with manufacturing and component constraints. Moving between digital and physical media helped students recognise discrepancies between perceived and actual form performance.

Peer critique sessions supported students in evaluating whether implemented forms communicated intended meanings. In Indian design contexts, form is also influenced by cultural semantics, where products carry social meaning and identity through formal expression¹⁴ This reinforces the importance of contextual sensitivity in form pedagogy – as illustrated in Figure 6.



Figure 6. Negotiating Expression and Feasibility.

Bridging Abstraction and Implementation

The framework encourages iterative movement between abstraction and implementation. Hybrid workflows that combine sketching, modelling, and making helped students integrate perceptual, emotional, and functional learning. Faculty-guided critique and reflection were important in helping students transition between conceptual exploration and practical realization—as illustrated in Figure 7.



Figure 7. Abstraction to Implementation

Discussion

The survey collected responses from 25 undergraduate design students across multiple design disciplines, including Industrial Design, Transportation Design, and Interaction Design. The respondents were distributed across academic levels, with approximately 52% second-year students, 40% third-year students, and 8% fourth-year students. 16 respondents had exposure to internships, workshops, or live industry projects, indicating varied levels of professional engagement. Students reported using multiple representational tools, including hand sketching, digital modelling, physical prototyping, diagramming, and AI-based tools, with a majority indicating that transitions from 2D to 3D representations significantly or moderately improved their understanding of form. Across responses, students consistently identified form as a combination of visual, functional, and emotional attributes, although many reported moderate challenges in translating abstract form concepts into functional and manufacturable designs.

Overall, students identified form as a combination of visual appearance, functional structure, and emotional expression. Many respondents associated form with perceptual attributes such as proportion, rhythm, geometry, and emotional qualities (e.g., soft, aggressive, calm, dynamic). Students reported using multiple representational tools—including hand sketching, digital sketching, diagramming, AI tools, and physical mock-ups—to explore form. The transition from 2D representations to 3D models was frequently cited as helpful in understanding scale, structure, and spatial relationships.

Students also indicated that peer critique, discussions, and studio feedback contributed to improved understanding of form communication and user perception. However, responses suggested varying levels of confidence in applying form knowledge to functional and manufacturable design outcomes, with many reporting moderate improvement rather than significant mastery—as illustrated in Figure 8.

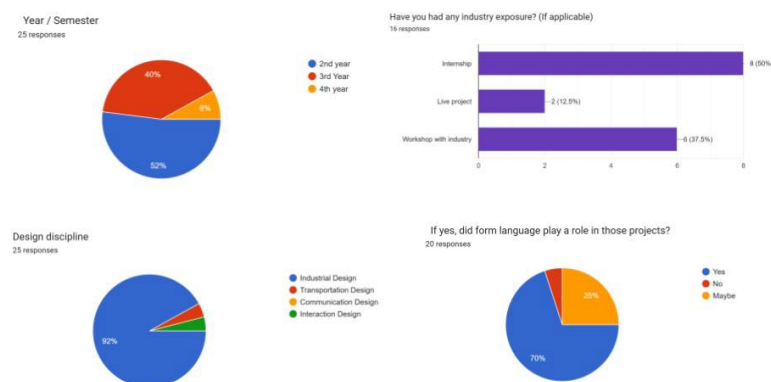


Figure 8. Participant Background.

Understanding of Form and User Perception

The survey results indicate that students generally perceive form as an influential factor in shaping user perception and emotional response. Several respondents noted that form communicates identity, emotion, and meaning prior to functional interaction, aligning with existing theories of product semantics and emotional design. Students frequently described how curvature, sharpness, and proportion influence perceived softness, aggression, friendliness, or intensity.

At the same time, students acknowledged that user perception is influenced by prior experiences and cultural expectations, suggesting an awareness of form as a contextual and interpretive construct. This

observation is consistent with semiotic and phenomenological perspectives on form perception in design theory.

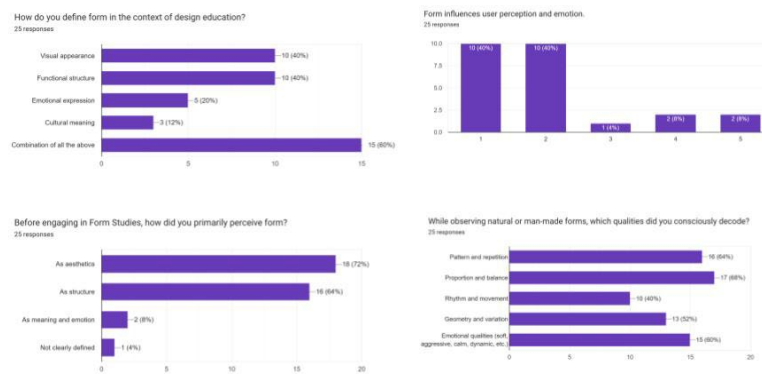


Figure 9. Understanding of Form.

Challenges in Translating Abstraction to Implementation

Despite recognising the importance of form studies, students reported difficulties in translating abstract formal concepts into functional and manufacturable products. Common challenges included balancing abstraction with ergonomics, integrating functional requirements, achieving manufacturability, and visualising complex forms in three dimensions. Several respondents also highlighted constraints related to time, technical skills, and access to fabrication resources.

These challenges indicate a gap between conceptual exploration and applied implementation, suggesting that abstraction exercises alone may not sufficiently prepare students for real-world design constraints. This reinforces the need for pedagogical frameworks that explicitly link abstraction, digital modelling, and prototyping stages.

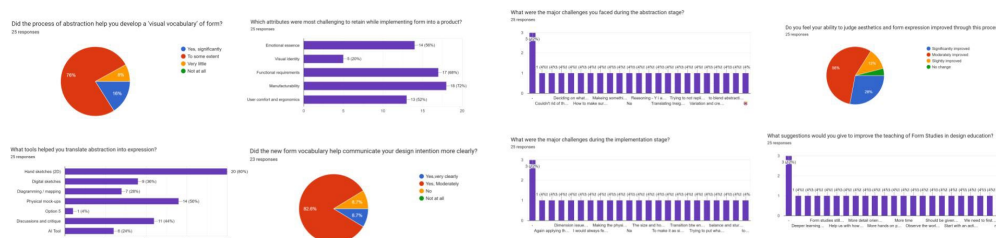


Figure 10. Learning Challenges & Reflection.

Pedagogical Implications

The framework shows that Form Studies is more effective when abstraction and implementation are connected rather than separated. Faculty scaffolding, reflective critique, and hybrid toolsets support deeper engagement with form as a system of meaning, function, and emotion.

Time for exploration and material experimentation is important for meaningful learning. Linking studio work with industry contexts can also help students understand professional constraints and opportunities. Overall, the framework aligns foundational design education with contemporary practice, where designers must balance perception, technology, and user experience.

CONCLUSION

This paper presents a conceptual pedagogical framework that treats Form Studies as an experiential and interpretive process. By linking abstraction and implementation in a continuous loop, the framework supports the development of perceptual sensitivity, emotional awareness, and functional reasoning in design education. Drawing on Lakoff and Johnson's theory of embodied cognition, this study suggests that form is not merely perceived visually but is understood through bodily, cultural, and experiential metaphors. Teaching form, therefore, becomes a way of shaping how students think, reason, and communicate through design.

Studio observations suggest that students move from seeing form as surface appearance to understanding it as a communicative and cultural construct. Faculty mediation, critique, and iterative making play key roles in this shift.

By connecting perception, interpretation, and material realisation, the framework addresses fragmentation in design pedagogy. It prepares students for professional contexts where form mediates human experience, technological systems, and cultural meaning. Future research could examine long-term learning outcomes, cross-cultural contexts, and the role of emerging computational tools in this pedagogical model. In contemporary design practice, where disciplines increasingly intersect, form literacy is critical not only for industrial designers but also for interaction designers, architects, engineers, and creative technologists.

While this framework was implemented with students transitioning from foundational studies to product design in Bangalore, the staged abstraction–implementation pedagogy presents a transferable model that can inform foundational design education across varied cultural and multi-disciplinary contexts.

As design increasingly mediates human experience across domains, cultivating form literacy through structured pedagogy becomes essential for producing meaningful and functional design outcomes.

NOTES

- ¹ Nigel Cross, *Designerly Ways of Knowing* (London: Springer, 2006).
- ² Oxman, Rivka. "Thinking Difference: Theories and Models of Parametric Design Thinking." *Design Studies* 52 (2017): 4–39
- ³ Klaus Krippendorff, *The Semantic Turn: A New Foundation for Design* (Boca Raton, FL: CRC Press, 2006); Roland Barthes, *Image–Music–Text* (London: Fontana, 1977).
- ⁴ Maurice Merleau-Ponty, *Phenomenology of Perception*, trans. Colin Smith (London: Routledge, 1962).
- ⁵ Donald A. Schön, *The Reflective Practitioner: How Professionals Think in Action* (New York: Basic Books, 1983).
- ⁶ Tim Ingold, *Making: Anthropology, Archaeology, Art and Architecture* (London: Routledge, 2013); George Lakoff and Mark Johnson, *Philosophy in the Flesh: The Embodied Mind and Its Challenge to Western Thought* (New York: Basic Books, 1999).
- ⁷ David A. Kolb, *Experiential Learning: Experience as the Source of Learning and Development*, 2nd ed. (Upper Saddle River, NJ: Pearson, 2015); Donald A. Schön, *The Reflective Practitioner* (New York: Basic Books, 1983).
- ⁸ Bryan Lawson, *How Designers Think: The Design Process Demystified*, 4th ed. (Oxford: Architectural Press, 2006).
- ⁹ Stephen Temple, "The Threshold of Abstraction in Beginning Design Pedagogy," *Journal of Design Studio* 2, no. 1 (2020): 101–110..
- ¹⁰ Donald A. Schön and Glenn Wiggins, "Kinds of Seeing and Their Functions in Designing," *Design Studies* 13, no. 2 (1992): 135–156.
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- ¹³ Perkins, David N., and Gavriel Salomon. "Transfer of Learning." *International Encyclopedia of Education* 2 (1992): 6452–6457.
- ¹⁴ Uday A. Athavankar, "The Semantic Profile of Products," in *Semantic Visions in Design*, ed. Susann Vihma (Helsinki: UIAH, 1990).

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CAREER-READY CREATIVES: A MULTIMEDIA EDUCATION FOR THE POST-DIGITAL WORLD

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INTRODUCTION

This paper presents the development of a new Multimedia major at Central Connecticut State University, designed to integrate design, communications, journalism, film, and music into a cohesive, interdisciplinary curriculum. The program responds to the rapidly evolving media landscape by fostering creative fluency and professional adaptability across diverse platforms. Grounded in the Conceive–Design–Implement–Operate (CDIO) educational framework, the curriculum emphasizes iterative problem-solving, user-centered design, and real-world collaboration through project-based learning experiences that closely mirror professional practice.

A distinguishing feature of the program is its alignment with the National Association of Colleges and Employers (NACE) career readiness competencies. The curriculum spans various courses, from podcast production and digital journalism to motion design and sound editing, each crafted to develop critical communication skills, technological fluency, ethical judgment, and professionalism. Students further enhance their practical abilities through capstone projects and internships with both campus and external media organizations, enabling them to apply their learning to contemporary issues in media and society.

By integrating a strong liberal arts foundation with technology-enhanced pedagogy and business-oriented learning outcomes, the Multimedia major offers a scalable, equity-minded model for interdisciplinary media education. This approach prepares students to navigate and shape the increasingly interconnected fields of communication, design, journalism, and creative production in a post-digital world. Graduates emerge with the adaptability and expertise required for success in today's dynamic media environment, equipped to address the challenges and opportunities of a rapidly changing industry.

HISTORICAL AND CONCEPTUAL CONTEXT: THE POST-DIGITAL CREATIVE LANDSCAPE

The emergence of what media theorists describe as the *post-digital* landscape has reshaped the ways creative practitioners work, collaborate, and circulate meaning. The post-digital does not refer to a world “after” digital technology but rather to one in which digital systems have become so ubiquitous that their presence recedes into the background of everyday life. In this environment, creativity unfolds across hybrid spaces where analog and digital, human and machine, production and distribution continually inform each other. As Florian Cramer argues, post-digital culture is marked

by “messy, hybrid, and material entanglements” that defy simple binaries and instead demand layered literacies and flexible modes of making.¹ These conditions have fundamentally changed expectations for media producers, who must understand not only their primary craft but the broader ecology in which visual, sonic, textual, and interactive forms circulate. These new tools have collapsed boundaries among once-separate domains: journalists now use data visualization, designers create motion and spatial experiences, musicians score for screen-based media, and filmmakers integrate text, sound, code, and analytics into their workflows.² The modern media creator is therefore expected to be a “creative technologist,” capable of moving across disciplines and responding to platforms that evolve rapidly and unpredictably.

These transformations reveal a deep structural tension. On one hand, humanities-based programs have historically offered students rich conceptual grounding, while often leaving limited space for applied production practice. On the other hand, technologically oriented programs have typically offered strong training in technical workflows but less emphasis on cultural critique, ethical reasoning, and social responsibility. However, sustainable success in creative industries now requires a synthesis of “technical capability, social intelligence, and cultural imagination.”³

A new model of creative education is therefore required uniting the theoretical strengths of the liberal arts with the applied strengths of professional production. Its interdisciplinary orientation reflects what Henry Jenkins describes as “convergence culture,” in which storytelling emerges through the coordinated contributions of multiple fields, tools, and perspectives.⁴ The major also aligns with national trends in media education that emphasize experiential learning, cross-platform literacy, and ethical design practices. As the Bureau of Labor Statistics and O*NET occupational data consistently highlight, careers in media production increasingly demand hybrid backgrounds.⁵ The next section explores how the CDIO framework provides the structural foundation for this interdisciplinary, adaptive, and ethically grounded approach to creative practice.

CDIO AS A FRAMEWORK FOR CREATIVE PROCESS

The Conceive, Design, Implement, Operate educational framework (CDIO) originated in engineering education as a response to mounting concerns that graduates lacked the real-world problem-solving skills required by industry.⁶ CDIO’s aim was not simply to teach students *how* to build things but to cultivate the dispositions required to guide complex projects through uncertainty, iteration, and public impact.⁷ Creative production unfolds through iterative processes similar to engineering: generating ideas, prototyping forms, revising through critique, and releasing work into public contexts. CDIO formalizes processes already central to media-making: cycles of inquiry, experimentation, failure, and refinement that mirror engineering’s systematic problem-solving.⁸

Conceive, maps directly onto the research and ideation practices at the heart of media creation. In journalism, it includes investigative framing, sourcing, and identifying a public need. In design, it includes understanding user needs, contexts, and constraints. In music and film, it involves conceptualizing mood, narrative flow, and aesthetic intention. Students learn to define problems within cultural, ethical, and social contexts.

The Design phase translates these conceptual insights into plans: storyboards, prototypes, wireframes, mock-ups, scripts, sound sketches, data visualizations, and timelines. This stage foregrounds collaboration and communication across disciplines, as teams reconcile disparate perspectives into a unified vision. Design pedagogy stresses the importance of critique as constructive feedback loops promote reflective judgment and help students situate their ideas within broader aesthetic and social frameworks.⁹ CDIO’s emphasis on structured iteration reinforces this process, ensuring that design decisions remain accountable to purpose and audience.

The Implement stage corresponds to the production of creative work: writing, filming, coding, rendering, mixing, animating, scoring, editing, and refining. Here, CDIO's engineering roots intersect with media production practices. Students must coordinate roles, meet deadlines, troubleshoot equipment, and adjust to unforeseen challenges, mirroring the collaborative pressures of contemporary creative industries.¹⁰ Implementation is a moment when ethical judgment about representation, accessibility, authorship, and impact take shape.

Finally, Operate requires students to release their work into public environments and evaluate its reception. In engineering, "operate" refers to maintaining systems in real-world use. In media education, this translates to publishing work online, exhibiting it in showcases, engaging audiences, evaluating communication success, and reflecting on impact. This final stage cultivates civic awareness by positioning creative work as part of larger public ecologies, reinforcing how it functions within communities.

By adopting CDIO, the CCSU Multimedia major frames creative practice as a system of inquiry, iteration, and public engagement. It provides a shared language across the program's four disciplines, allowing faculty and students to align diverse practices within a coherent pedagogical model. CDIO serves as a cultural foundation that links creativity with ethical and professional formation.

NACE CAREER-READINESS COMPETENCIES AS IDENTITY FORMATION

While the CDIO framework provides the structural and methodological backbone of the Multimedia major, the NACE Career-Readiness Competencies articulate the interpersonal, ethical, and professional dispositions that students must cultivate in order to thrive within contemporary creative industries. Developed by the National Association of Colleges and Employers, the competencies define career readiness as "the attainment and demonstration of requisite skills that broadly prepare college graduates for a successful transition into the workplace."¹¹ What distinguishes NACE from discipline-specific standards is its holism: it recognizes that employability depends not only on technical ability but also on communication, equity-mindedness, ethical judgment, and self-directed growth. These competencies serve as an essential counterpart to CDIO's process-based approach.

The NACE model includes eight core competencies:

- Career & Self-Development,
- Communication,
- Critical Thinking,
- Equity & Inclusion,
- Leadership,
- Professionalism,
- Teamwork,
- and Technology.¹²

Each competency is deeply connected to the types of behaviors, mindsets, and ethical practices expected in media-related fields. Communication, critical thinking, and technological fluency now operate as shared, cross-disciplinary competencies—essential for journalists and filmmakers, designers and music technologists alike—as creators increasingly articulate intent, evaluate information, collaborate across fields, and navigate complex digital and AI-driven production systems, and create and communicate in ways that honor diverse identities and communities.¹³

While CDIO teaches students *how* to work; NACE teaches them *who they must become* as responsible creative professionals. Students move through CDIO's phases while simultaneously cultivating NACE's competencies:

- **Conceive** corresponds to critical thinking and equity-informed inquiry.

- **Design** corresponds to communication, teamwork, and leadership.
- **Implement** corresponds to professionalism, initiative, and technological fluency.
- **Operate** corresponds to civic engagement, ethical reflection, and career self-development.

This integration ensures that creative assignments become more than demonstrations of technical skill. Recent scholarship emphasizes that the most effective creative curricula embed professional competencies horizontally across coursework rather than confining them to capstone or career-preparation experiences.¹⁴ The Multimedia major's integration of NACE competencies into every course ensures that students develop a consistent professional vocabulary that informs their academic, creative, and civic identities.

NACE's emphasis on Career & Self-Development is also particularly relevant within a fast-changing media landscape. Creative industries are often characterized by freelance work, nonlinear career trajectories, and the necessity for continuous reskilling. By helping students map their competencies, identify areas for growth, and articulate strengths through reflective practice, the Multimedia major positions graduates to sustain themselves professionally beyond their first job. This competency also reinforces the liberal arts foundation of the major, encouraging students to interpret their skills within broader social, cultural, and historical conversations rather than seeing career readiness as a purely technical exercise. These competencies are realized within the interdisciplinary architecture of the Multimedia major integrating design, journalism, communication, film, and music technology into a coherent learning ecosystem.

INTERDISCIPLINARITY AS STRUCTURE: INTEGRATING DESIGN, JOURNALISM, COMMUNICATION, FILM, AND MUSIC

The Multimedia major's interdisciplinary architecture responds to the evolving media ecosystem described earlier and reflects a deliberate design strategy for educating creative practitioners who can navigate complex, hybridized environments. Contemporary digital tools have "flattened" distinctions between media types, allowing creators to work fluidly across images, text, motion, and sound.¹⁵ This demands a curricular structure combines together multiple epistemologies and modes of practice into a coherent pedagogical ecosystem. This Multimedia major integrates design, journalism, communication/film, and music technology as mutually reinforcing domains of creative knowledge.

Design, the first of these domains, provides students with a foundational visual literacy essential for communicating in a highly image-centric world. Courses in typography, information design, motion graphics, and UX/UI habituate students to think in terms of systems—how images, text, and interactive elements work together to shape user experience. Design teaches students to solve problems visually and structurally through composition, hierarchy, and rhythm. These skills are essential not only within design-specific careers but across all media fields, where clarity, inclusivity, and communicative precision define the success of storytelling.¹⁶

Journalism contributes a critical counterbalance to design's visual orientation by foregrounding ethics, evidence-based communication, and public accountability. In an age of widespread misinformation, journalistic habits of inquiry—such as source evaluation, fact-checking, interviewing, and narrative framing—are indispensable across creative industries. Journalism also provides methodological rigor through data analysis and visualization, equipping students with the ability to transform complex information into compelling narratives. Data storytelling has become central to contemporary media literacy, positioning journalists not only as communicators but as interpreters of social and technological systems,¹⁷ ensuring that students develop a civic orientation and a commitment to truth that anchors their creative endeavors.

The third disciplinary strand, Communication and Film, introduces students to the languages of moving images and mediated storytelling. Courses in film production, editing, cinematography, and

digital narrative build students' fluency in visual and temporal composition while also cultivating an understanding of audience reception and rhetorical strategy. Film functions as both an art form and a communication technology, shaping cultural experience and influencing public perception. The collaborative nature of film production—requiring coordination among directors, editors, cinematographers, and sound designers—models the teamwork and leadership skills reinforced by NACE competencies. Moving-image literacy is fundamental in an era where video is among the most dominant forms of online discourse.¹⁸

Music technology completes the quartet by introducing students to the sonic dimension of multimedia storytelling. Courses in audio production, sound recording, mixing, and scoring teach students to manipulate sound as a communicative tool. Sonic literacy increasingly important as podcasts, interactive media, XR environments, and audiovisual hybrids proliferate. Music technology also intersects with design and film through soundtracks, Foley, and interactive sonic interfaces. Audio is often the “invisible connector” that binds media experiences together, heightening emotion and guiding interpretation.¹⁹ By integrating music technology into the core curriculum, the major builds a holistic understanding of media that transcends visual dominance.

Each discipline contributes distinctive capabilities while remaining interdependent within real-world creative contexts. This structure mirrors professional creative industries, where interdisciplinary collaboration is the norm. A typical multimedia project—a data-driven documentary, interactive website, AR installation, or branded video—requires designers, journalists, filmmakers, sound engineers, and coders. The program's integrative design ensures that students do not merely understand the “language” of their own discipline but become conversant in the languages of their collaborators.

Interdisciplinarity within the Multimedia major is not simply a structural convenience—it is a philosophical stance. It affirms that media practices are inherently relational: every design solution is shaped by narrative; every narrative is shaped by sound; every sound contributes to emotional resonance; and every emotional arc depends on visual coherence. By refusing to silo disciplines, the program cultivates a more complex, critical, and flexible creative identity in students. This model also fosters equity and access: students with different strengths—verbal, visual, sonic, analytical—can find meaningful entry points while gaining literacy across modalities. As the next section will show, this interdisciplinary foundation guides students through a transformative educational arc grounded in creative fluency, ethical practice, and adaptive professional identity.

STRUCTURE OF THE MULTIMEDIA MAJOR: FOUNDATIONS, CORE, AND PATHWAYS

The architecture of the Multimedia major provides students with a structured yet flexible progression from foundational literacy to advanced, domain-specific practice. This structure, composed of Foundational Courses, a Core Curriculum, and four Pathways of Practice, encourages specialization through elective depth, and integrates professional competencies at every stage.

Foundations: Establishing Cross-Media Literacy

The program begins with five foundational courses that introduce the essential grammars, tools, and conceptual frameworks of graphic and information design, journalism, film, media studies, and music technology. These courses build baseline fluency across media modalities, foster early cross-disciplinary collaboration, meet General Education requirements to improve access, and support the liberal arts mission by integrating historical, theoretical, and ethical perspectives—including representation, authorship, media effects, and accessibility. This early grounding aligns with the “Conceive” phase of CDIO, helping students identify problems and opportunities within broader social contexts.²⁰

Core Curriculum: Developing Mid-Level Creative and Analytical Competence

Upon completing the foundation sequence, students advance to the 24-credit Core Curriculum, which deepens their practical and analytical abilities across the four domains of the major. These courses include typography and design history, digital imaging and motion graphics, audio production, social media journalism, media literacy, creative coding in music, and ensemble-based musical performance.²¹ Most of these courses are practice-intensive, requiring students to produce creative artifacts across modalities such as podcasts, motion graphics, coded media objects, and short-form journalism.

The Core serves as the “Design” and early “Implement” phases of the CDIO process: students prototype, storyboard, critique, revise, and produce increasingly complex media forms. Each course embeds relevant NACE competencies: communication and teamwork in group productions; professionalism in time-managed projects; critical thinking in interpretive and analytical work; technology in advanced tool use; and leadership in collaborative production teams.

The inclusion of Media Literacy ensures that technological proficiency does not eclipse analytical depth. Students learn to interrogate the very media systems they produce within, gaining the capacity to analyze the sociopolitical, economic, and historical forces shaping contemporary communication. This blend of production and critical literacy is widely recognized as essential to preparing students for ethically responsible creative work.²²

Pathways of Practice: Specialization and Creative Identity Formation

After completing the Core, students choose from four Pathways of Practice, each representing an area of disciplinary depth and professional specialization. Unlike traditional “tracks,” these pathways are not rigidly siloed; rather, they function as thematic clusters that help students develop a coherent creative identity while retaining access to cross-disciplinary electives.

Emerging Technology in Multimedia

This pathway explores frontier tools and modalities, including AI-assisted design, AR/VR environments, 3D modeling, interactive systems, and ethical frameworks for emerging media. These courses encourage students to examine how technological systems structure perception, interaction, and agency.²³ The pathway positions students as “critical technologists,” combining technical experimentation with ethical inquiry.

Data Visualization in Multimedia

This pathway merges journalism, design, and information science, preparing students to transform data into meaningful visual stories. Courses such as Data Journalism and Visualizing Data Narratives help students learn to analyze datasets, design interactive dashboards, and translate complexity into clarity.²⁴ This specialization aligns with industry demand for designers and journalists who can bridge the gap between computation and communication.

Motion Graphics & Human-Centric Design

Focusing on screen typography, UX/UI systems, motion design, and time-based visual communication, this pathway emphasizes user-centered creative practice. Students take courses like Digital Storytelling through Motion Graphics and UX/UI, learning to design experiences that integrate movement, rhythm, and interactivity.²⁵ The pathway reflects the increasing prominence of motion graphics and interface design in digital communication.

Video & Music for Multimedia

This cinematic and sonic pathway integrates film production, editing, audio engineering, scoring, and sound design. Courses such as Digital Film Production I, Sound Recording, and Audio Mixing immerse students in collaborative production environments.²⁶ Students learn the full workflow from script to screen, developing both aesthetic judgment and technical expertise.

Pathways as Individuation and Professional Formation

The pathways collectively support what educational theorists describe as the “individuation” of students’ creative identities.²⁷ Through elective depth, students craft a profile that reflects their strengths and career aspirations while retaining the ability to collaborate across media forms. This system supports both specialization and adaptability—qualities essential to navigating evolving media industries.

The next section turns to experiential learning, examining how capstones, internships, and community partnerships extend the curricular structure into real-world creative ecosystems.

Experiential Learning: Capstones, Internships, and Community Partnerships

Experiential learning lies at the center of the Multimedia major’s pedagogical identity, functioning as the culminating integration of CDIO’s iterative cycle and NACE’s professional competencies. While the foundational and core sequences cultivate breadth and depth across media modalities, it is within the capstone experiences, internships, and community-engaged projects that students apply, refine, and operationalize their knowledge in authentic creative contexts. These experiential components ensure that students emerge with the ability to navigate the workflows, ethical challenges, and collaborative dynamics of contemporary creative industries.

The Experiential Learning Philosophy

Experiential learning in creative fields involves far more than “hands-on” exposure; it constitutes a structured environment in which students learn to manage real constraints, interact with stakeholders, and deliver work that has public meaning and accountability. Such experiences provide students with the “transformational learning” necessary to connect academic study with professional identity.²⁸ Within the Multimedia major, experiential learning is intentionally aligned with the *Operate* phase of the CDIO framework: students deploy their work in real or simulated public contexts, evaluate outcomes, and reflect on their personal and professional growth. This iterative feedback loop is crucial for building adaptive, resilient creators who can respond to changing technologies and audiences.

Capstone Trajectory 1: Career-Based Internship / Central Design

The first of the program’s two capstone options centers on career-based internships or participation in Central Design, an internal design and media production studio that collaborates with both campus units and community partners. Students enroll in discipline-specific internship courses that each require a minimum number of supervised hours in a professional or quasi-professional environment.²⁹ In these settings, students encounter real workflows: they respond to client briefs, manage production schedules, negotiate revisions, and problem-solve under deadline pressure. The unpredictability of client-based work becomes an instructional asset. Students learn to handle feedback from stakeholders who may not share disciplinary vocabulary; they develop skills in diplomacy, client management, and communication; and they confront ethical questions around representation, authorship, and community impact.

NACE competencies are deeply embedded in these experiences:

- Professionalism emerges through accountability and time management;
- Teamwork through collaboration with peers or external partners;
- Leadership through assuming project responsibility;
- Technology through the application of advanced software and hardware;
- Equity and inclusion through the need to design accessible, ethical, and community-responsive media.

Internships serve as sites for the formation of ethical and professional identity.

Capstone Trajectory 2: Portfolio-Based Independent Study

The second capstone trajectory emphasizes individual creative or research-based inquiry through courses.³⁰ Students propose, design, and produce a significant media project under the guidance of a faculty mentor, often working across multiple modalities. The independent-study capstone emphasizes the Conceive and Design phases of CDIO, requiring students to articulate a research question, creative vision, or community need. They identify audiences, methods, frameworks, and evaluation criteria, then iterate through prototypes, drafts, and critiques before presenting a polished work in a public showcase, exhibition, screening, or digital release. This option also enables students to pursue specialized pathways less available through internships—such as experimental media, longform documentary, XR development, investigative journalism, sound art, or community-based storytelling.

Career Preparedness Course

Complementing both capstone pathways is the College-to-Career Readiness course, which functions as a professional-development bridge between academic study and post-graduation life. This course helps students articulate their skills, map their NACE competencies, assemble resumes and digital portfolios, and analyze job descriptions in creative industries. It anchors the self-reflective component of the major by helping students identify both strengths and growth areas. By encouraging intentional career mapping, the course recognizes that students in creative fields often follow nonlinear professional trajectories requiring adaptability and lifelong learning.

Community Partnerships and Public Engagement

The Multimedia major's experiential learning model extends beyond individual projects to embrace partnerships with community organizations, public institutions, and local media. These collaborations produce reciprocal benefits: students gain professional experience while communities gain access to creative and technical services. Such partnerships align with CCSU's Strategic Plan 2030, which identifies community engagement as central to academic excellence and the university's public mission.³¹ By situating student work in real-world ecosystems, the program fosters civic responsibility and highlights media's social impact, showing it contributes to public discourse and community well-being.

Experiential Learning as the Integrative Spine of the Major

The capstone pathways, internship opportunities, and community partnerships function as the integrative spine of the Multimedia major. They bring CDIO's process-based pedagogy and NACE's competencies into direct conversation, ensuring that students graduate with both creative fluency and professional readiness. As the next section shows, these experiential components build on a pedagogical culture of innovation and assessment that positions CCSU's Multimedia major as a model for 21st-century creative education.

ASSESSMENT AND PEDAGOGICAL INNOVATION

Assessment and pedagogy within the Multimedia major are intentionally designed to support an educational environment grounded in iteration, reflection, interdisciplinarity, and professional readiness. Unlike traditional assessment models that isolate creativity into discrete assignments or technical proficiencies, the Multimedia major relies on a hybrid, integrative assessment framework that braids together CDIO's process orientation, NACE's competencies, and discipline-specific criteria drawn from design, journalism, communication, and music technology. This approach ensures that students' creative work is evaluated for the intellectual, ethical, and collaborative processes that produced it, aligning assessment as a form of reflective learning rather than a mere endpoint.³²

Hybrid Rubrics: CDIO + NACE + Creative Output

Central to the program's assessment philosophy is the use of hybrid rubrics that map each major assignment or project onto three domains: the CDIO phase(s) it engages, the NACE competencies it develops, and the disciplinary learning outcomes associated with specific creative modalities. For example, a motion-graphics project may be assessed for its conceptualization (Conceive), storyboarding and prototyping (Design), animation workflow (Implement), and release strategy, accessibility, and reflection (Operate). Simultaneously, the project is evaluated for communication effectiveness, professionalism in meeting deadlines, and equity-minded design choices—corresponding to the relevant NACE competencies.

This multi-axis rubric encourages students to recognize connections between methodology and professionalism. It reinforces that creative practice is not simply about producing aesthetically pleasing artifacts but about managing the entire lifecycle of a media project. This approach aligns with research in design education emphasizing that creative assessment must capture “the process of making thinking visible.”³³ By foregrounding process alongside product, the Multimedia major makes assessment a tool for teaching students to think systematically and ethically.

Reflective and Metacognitive Practices

The program embeds reflective writing, critique, and metacognitive analysis across all levels of the major. Students maintain journals, process logs, design reflections, and post-production reports as part of their coursework. These reflective activities serve several purposes: they help students articulate their reasoning, document decisions, and interrogate challenges encountered during production, they support the development of a professional vocabulary that enables students to communicate with collaborators, faculty, and future employers about their creative processes, and the reflective practice helps students map their growth across CDIO phases and NACE competencies, making their learning visible and intentional. Each student becomes a “reflective practitioner” dialoguing between action and reflection.³⁴

Faculty Collaboration and Interdisciplinary Assessment Cultures

Because the Multimedia major spans four academic departments, faculty will meet regularly to align expectations, share disciplinary expertise, and calibrate assessment practices. The development of shared rubrics ensures consistency across courses while honoring the distinct vocabularies and traditions of each discipline. As the Multimedia Overview document notes, “interdisciplinary coordination” is a defining feature of the program's design, enabling faculty to treat the major as a creative ecosystem rather than a collection of isolated courses.³⁵ Assessment practices benefit from this richness, enabling faculty to evaluate student work through multiple lenses while also preparing students for creative industries.

Integrating Technology-Enhanced Pedagogy

Technological innovation plays a significant role in shaping assessment practices within the Multimedia major. The program embraces emerging technologies such as AI-assisted design and machine-learning tools for image, sound, and text generation. These tools open new pedagogical questions around authorship, algorithmic bias, and creative labor. Faculty use assessment also to promote ethical reasoning about technological affordances because technology is never neutral; assessment must therefore account for students' understanding of how tools shape cultural meaning and social power.³⁶

Assessment as Professional Preparation

The ultimate purpose of the program's assessment philosophy is to prepare students for the expectations and rhythms of creative industries. Professional practice involves continuous iteration, critique, teamwork, and revision—processes that are mirrored in the program's assessment structures. Assessment practices enable faculty to evaluate student work through multiple perspectives and prepare students for creative industries where working across roles, backgrounds, and expertise is the norm.³⁷

Pedagogical Innovation as Institutional Strategy

Finally, the pedagogical and assessment innovations within the Multimedia major support broader institutional goals articulated in CCSU's *Strategic Plan 2030*. The plan calls for improving student success through innovative instructional practices, interdisciplinary collaboration, and community-engaged scholarship.³⁸ The Multimedia major embodies this strategy by uniting assessment with creativity, ethics, and career preparation, positioning itself as a model for how liberal arts institutions can reimagine creative education for a rapidly changing media landscape.

CONCLUSION

The Multimedia major at Central Connecticut State University provides a timely response to the demands of a rapidly evolving post-digital media landscape. Grounded in interdisciplinary integration, the program unites design, journalism, communication, film, and music technology to develop the creative, analytical, and ethical capacities required in contemporary media work. Through the CDIO framework—Conceive, Design, Implement, Operate—the major makes visible the iterative, collaborative processes that shape creative production, while incorporating NACE competencies ensures that students build not only technical fluency but also the professional habits and reflective judgment essential to responsible practice.

Its structure cultivates broad media literacy alongside individualized creative identity. Whether students pursue emerging technologies, data visualization, motion design, or video and music production, they learn to navigate the convergent media environments that define contemporary communication. Experiential components—including internships, portfolio-based capstones, and community partnerships—situate learning in real-world contexts, helping students understand both how to create and why creative work matters within public and cultural life.

Across all stages of study, assessment practices reinforce intentionality, reflection, and alignment between process and product. Hybrid rubrics, critique-based learning, and faculty collaboration foster a culture in which creativity is understood as iterative, relational, and accountable. Taken together, the Multimedia major offers a model for integrative media education, preparing graduates to conceive ideas, design solutions, implement creative visions, and operate with adaptability and ethical awareness in dynamic professional environments.

NOTES

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- ³ Richard Florida and Ian Hathaway, *The Rise of the Global Creative Class* (Washington, DC: Brookings Institution Press, 2018), 45.
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- ⁶ Edward F. Crawley et al., *Rethinking Engineering Education: The CDIO Approach*, 2nd ed. (New York: Springer, 2014), 1–5.
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- ³⁰ Central Connecticut State University, *Integrated Multimedia Production, B.A.*
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RESEARCH THROUGH VISUALISATION

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INTRODUCTION

Imagery is strongly linked to the day-to-day functioning of the human mind. In the simplest sense, this could mean that beings rely on images to understand their surroundings; at a deeper level, it presents a complex scenario in which the mind is constantly at work, interpreting all information and data it has acquired into images for better understanding. The process from data to image could be termed visualisation, which, in its own way, is how the mind operates. Scientific data also suggests that the mind's predominant modus operandi is visual.¹ History also verifies that the primary human language has always been an image (cave paintings of Sulawesi²), further emphasising the role of the image in perception and data analysis. The role and interplay of text/language then present a complex scenario for distinguishing, or even creating, a hierarchical understanding of text and image.

Objectives

The paper emphasises the significance of ideas and visualisation processes in social research. Visualisation involves establishing connections and hierarchies among keywords, thoughts, and observations. The paper aims to highlight the acceptance of visualisation and conception not only for presentation but also for structuring ideas, formulating arguments, and arriving at comprehensive conclusions.

TYPES OF VISUALISATIONS

Mapping Type

The history of mapping is older than the history of script. The earliest maps were found to be more symbolic in nature and were seen as attempts to make a visual sense of one's surroundings. One of the oldest maps, usually inscribed on a stone or clay tablet, is the Babylonian world map, created in 600 BC. In 500 BC, the practice of mapping adopted a more scientific approach under Greek influence, with Ptolemy's invention of coordinate systems transforming maps from mental/symbolic visuals into a scientific representation of the physical world. Meanwhile, between 500 and 1400 CE, maps such as Mappa Mundi, which place the sacred city of Jerusalem at the centre of the world, emphasised and projected cultural norms and doctrine rather than the reality of the physical world.

However, after the invention of printing systems and tools using scale, projection, and legends, maps began to explain more than just world views and geography. Now, Maps have begun representing demographics, economic environments, and patterns, and have thus been used to display data such as John Snow's 1854 cholera map.

Now with the invention of tools like GIS interactive Maps, satellite imagery, the maps and the exercise of mapping have been revolutionised, where Maps are not just used to represent data or to

deliver a set of information, but rather used to establish hierarchy and relationships to analyse and demonstrate flow systems and to aid the process of critical thinking.

Types of maps

1- Geographic/spatial map

Such maps are usually employed to represent physical spaces, such as topographic, zoning, or navigation maps.³

2- Thematic maps

Thematic maps juxtapose data visualisation and space to represent specific data, patterns, or values within a defined boundary/area, such as Choropleth, density, or heat maps.

3- Schematic maps

Schematic maps establish and represent existing relationship systems and networks in space, E.g., transit maps and network maps.

4- Conceptual maps

Conceptual maps visualise ideas and thoughts, such as mind maps, cognitive maps, and argument maps.

5- Cognitive and mental maps

Such maps document how people/users perceive and conceive spaces and surroundings, i.e. mental maps and behavioural maps.

6- Cultural and narrative mapping

Cultural and narrative maps generally represent unconventional practices and indigenous mapping techniques to Document processes and stories, such as story maps and participatory maps.

7- Temporal maps

As suggested by the name, temporal maps represent change, which is subject to the passage of time, i.e., timelines, time-space diagrams, etc.

8- Digital and interactive mapping

These maps are defined by the methods used to develop them within our subject matter and are created with the user's responses and demands in mind, including GIS, web, and VR maps.



Figure 19. Mapping the Evolving Trajectories of Lahore⁴

The above map combines mapping and layering, with diagram methods used to portray specific information. The diagrammed map is an excellent way to represent data concisely. The purpose, as outlined by the objectives and research questions, focuses on specific data that could be highlighted through the suggested method.



Figure 2. Demonstrating the changing urban form of the informal Katachi Ababdi near Main Plaza, Johar Town, Lahore, over the years.⁵

Diagram Type

In historic times, diagramming was used as a thinking tool rather than a mere graphic. Prehistoric notations, Egyptian proportional grids, and Euclidean Greek geometry were heavily dependent on diagramming as a thinking tool for establishing and presenting ideas in a visual world.

Diagrams were later used to explain philosophical and theological phenomena, such as cosmological diagrams, genealogical trees, and the visualisation of monastic scripts to explain time and morality. However, scholars like Leonardo da Vinci employed diagramming as an analytical tool reflecting observation and creativity through anatomical and mechanical illustrations. Later diagrams began representing abstractions in visual logic, such as Descartes's coordinate systems.

By the 19th century, with the introduction of bar, pie, floor charts, and polar area diagrams, the purpose and use of diagrams were revolutionised, as they began to reflect relational shape logic and design systems. Now, with the introduction of BIM, algorithms, and parametric tools, diagrams are being used to generate and modify form in architecture and beyond.

Types of Diagrams

1- Structural diagram

The structural diagram represents the provided elements and their organisational structure. These diagrams are typically used to represent systems, classifications and categorisations. I.e., three diagrams: hierarchy diagrams, organisation charts, etc.

2- Relationship diagrams

As suggested by the name, such diagrams establish a relationship between the provided components and reflect on the nature of that relationship. Such diagrams are used to explain connections, networks, and relationships, e.g., network, Venn, and matrix diagrams.

3- Flow diagram

Exhibiting order, direction, and transformation, these diagrams are used to explain workflows, logistics, and related systems, such as flowcharts and process charts.

4- Temporal diagram

As the name suggests, these diagrams are time-bound, reflecting transformations/modifications that occur over a specific period. Such diagrams are employed in project planning to demonstrate life-cycle analysis. Gantt charts, timelines, and event sequence diagrams are examples of temporal diagrams.

5- Statistical diagrams

These diagrams represent quantitative analyses of numerical data and are used to show correlations, trends, and comparisons. Examples of such diagrams include bar and pie charts.

6- Geometric diagrams

Employed mainly in architecture and design, these diagrams represent design ideas through specialised abstractions such as axonometric diagrams, sectional drawings, and bubble diagrams.

7- Narrative diagram

These diagrams are narrative-based, i.e., they rely heavily on a story or a thesis. Example of such a diagram, story diagram, visual essay, info graphic narrative, etc.

A diagram can present data most simply and directly. At the same time, it can achieve a high level of complexity, showing progression, layers of information, or even multiple data points at a single glance within a single image type.

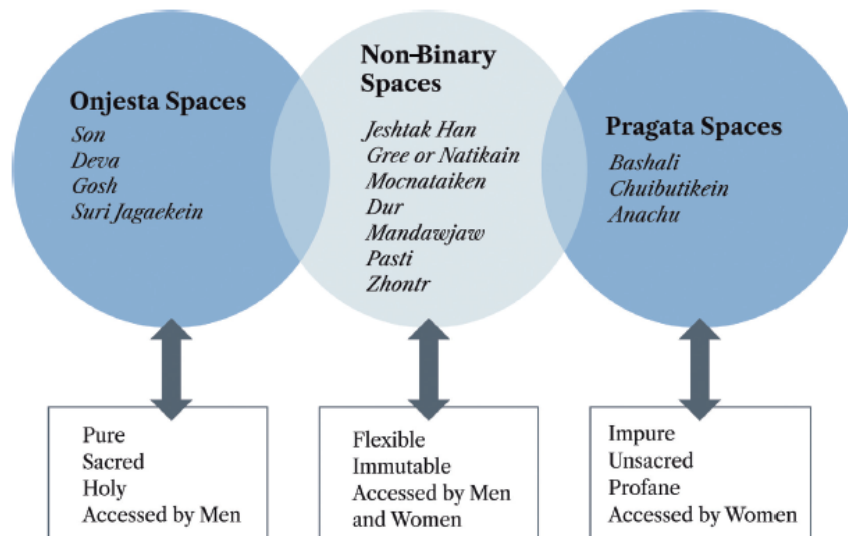


Figure 3. Concept Diagram⁶

Table and Chart Type

A table or chart is the simplest form of method to tabulate, list, and present data in a particular sequence. The aim of any table or chart is to present all the data in a particular sequence, which, at most, could hint at a hierarchy. Tables in this regard are essential for describing data and drawing basic conclusions. Tables or charts are often the starting point after data collection is completed. A preliminary analysis of the data could be efficiently conducted using this method. However, tables have the potential to effectively enhance the analysis stage of the research. Overlaying tables with symbols, lines, and arrows could be the first step to initiate further links and connections. The deductive method could be applied through colour coding or outlining to demarcate primary and secondary data. Hence, tables are essential stepping stones for the analysis stage; they have numerous features built into their tabular systems that can support research success.

The following table is an example of tabulating various forms of data into a table or chart.

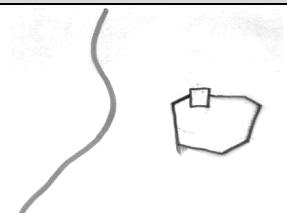
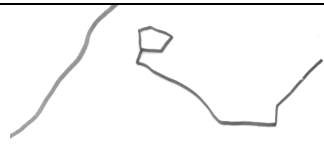
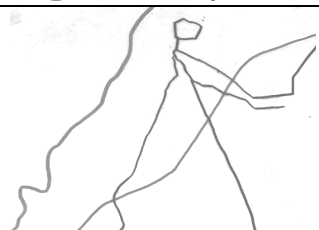
Sr No	Time Era	Comparative analysis of the trajectory in the identified era
1.	Mughal Era: The Walled City was developed on the northwest side, east of Ravi.	
2.	Colonial Era: Mall Road marked the city's colonial era and future direction.	
3.	Colonial Era: Development of Jail and Ferozepur Road further establishes the trajectory of the Mall Road.	
4.	Post-Colonial / Post-Partition Era: The Raiwind road shoots straight from the walled city and extends the city into its peri-urban areas, like Raiwind. It stretches the town towards the south.	
5.	Post-Colonial/Post-Partition Era: The final Trajectory encircles all the previous trajectories, closing the loop around the city. The map indicated the city's natural and man-made boundaries, including the River Ravi, the BRB Canal, and the six peripheries. The map also clearly marks the comparative scale of the first and last loops of the city of Lahore.	

Table 4. Trajectory of Lahore city in the identified time era⁷

The table above is an example of combining text and images to represent the hierarchy of the overall argument. The image and text support each other, and the linear representation has the potential to bring forth the city's chronological or formal growth over time. Tables of charts are excellent for descriptive, analytical, or concluding sections of a research paper. The next step for these forms is to overlay them with other analytical tools to compose complex diagrams that can transform them into unique, specific ideas specific to the study.

Picture Type

The most fundamental form of human-created idea or object is the conception of an image, such as the vivid animal depictions in the 40,000-year-old cave paintings at Chauvet Cave in France.⁸ The image is the first language of human beings, the first form of communication, predating spoken or written words, the first ever presentation of their existence to the world, and the primary record of history before scripts emerged. A picture is worth a thousand words; this timeless proverb, often

attributed to the ancient Chinese philosopher Confucius and popularised in the West by Fred R. Barnard in 1921, succinctly summarises the argument and underscores the necessity of an image in a research paper. An image fundamentally solidifies an abstract ideation, transforming fleeting thoughts into something viewers can grasp and debate.

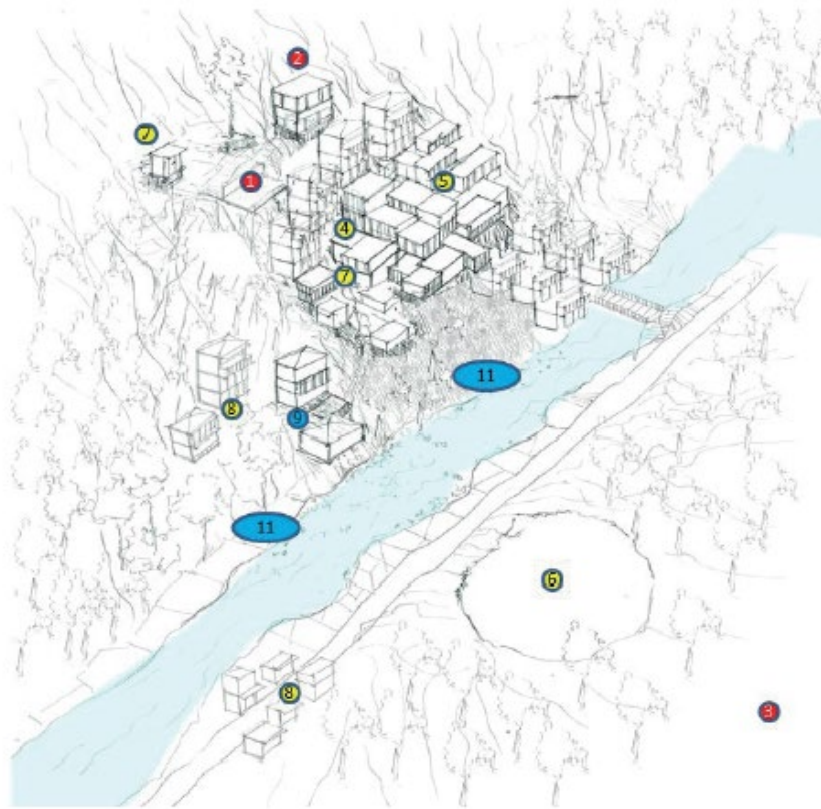


Figure 4. Building Typologies and Spatial Syntax of a Village in Kalash⁹

In this regard, any intangible notion or concept, whether it involves unimaginable aspects, such as quantum phenomena, or is concrete yet elusive, such as urban social dynamics, can be made tangible through its interpretation as an image. It could be achieved by representing and capturing those ideas in real-life scenarios, such as photographs of informal markets in Lahore's old city that reveal everyday economic flows,¹⁰ or by recreating scenarios through the lens of proposed ideation. An image could also be a hybrid, blending photography, diagrams, and data overlays to convey multifaceted truths, as seen in Bruno Latour's actor-network diagrams that map human-nonhuman interactions.¹¹

The success of good research lies in the researcher's ability to identify and apply a unique method to the study, which could, in itself, yield a new type of representation—think of interactive GIS visualisations or AI-generated speculative architectures. The above-mentioned types are the most basic forms or tools for visualisation, rooted in millennia of human expression from Lascaux to Lightroom, but they should in no way be limited to the list above; innovation demands pushing boundaries to match the complexity of today's non-Western urban theories and ecologies.

VISUALISATION AT VARIOUS STAGES OF RESEARCH

Title

The title or the name is the principal identification of an article or publication. It is the foremost representation of the whole research; hence, the design of the title and its importance cannot be neglected. The title, at its ideation stage, could incorporate the entire research. It could be achieved by mapping the title at the earliest stages of research. The title ideally consists of keywords that serve as the backbone of any study. It is the keywords that propose the initial hierarchy of primary and secondary aspects and the main connections established within these hierarchies in the research. Mapping entails incorporating all stages of research into the title, including the study's significance, global and local aspects, the literature review keywords, methodologies, and hypotheses that lead to the analysis and possible conclusions. The above can be further explained through the following figure:

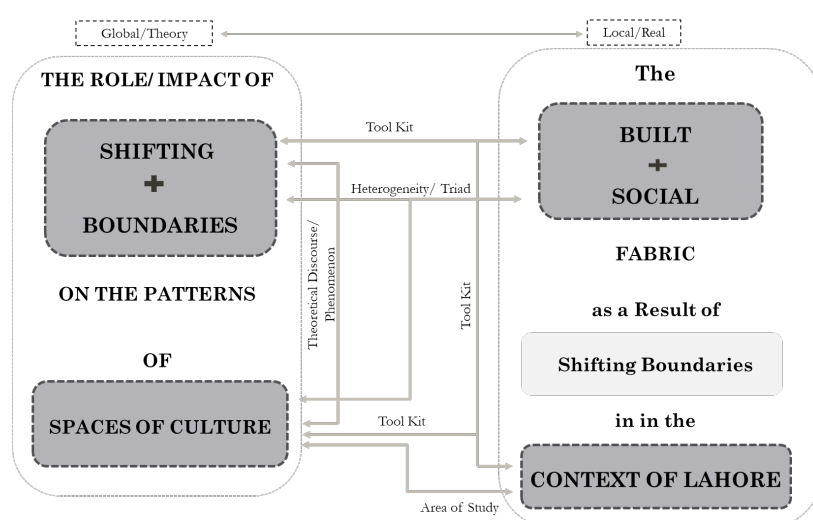


Figure 5. Mapping the Title

The above mapping of the title, proposed during the first year of the PhD, intends to represent various stages of the research, such as global and local aspects of the study, the theoretical framework, toolkit for data collection, and also the area of the study, through the juxtaposition of the title and subtitle, connecting the various keywords to derive meanings, and highlight the primary and secondary aspects of the study. The figure is a good example of layering, dissecting, and re-connecting the title as a jigsaw to arrive at multiple ways to conduct, analyse, and conclude the study.

Research Questions and Objectives

The research questions and objectives are the most crucial part of any research. Well-developed, well-written questions can clearly indicate the study's complexity and the processes and methodologies involved. Rq's and objectives: the primary goal is to present the research hierarchy or structure. These hierarchies are most often built into the text's sequence, but ideally could be represented in a diagram. The Rq's and objectives are a culmination of keywords, formulated through their linkages and subsequent connections. They highlight that, if well-conceived, the primary and secondary levels of research could be projected through the overlay of a diagram. The following figure presents a comprehensive diagram of the research questions and objectives that lead to the methodologies proposed and developed.

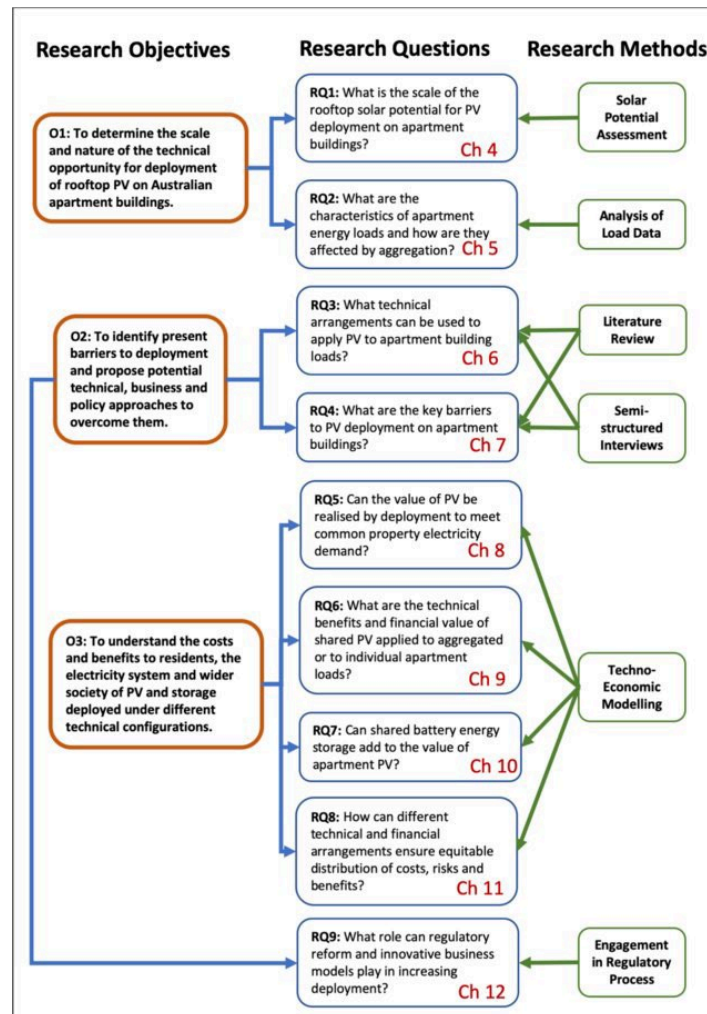


Figure 6. Mapping research objectives, questions and thesis chapters to research methods¹²

Literature Review

In most studies, literature reviews initiate with systematic keyword identification from diverse sources, such as textual databases, visual archives (e.g., historical or thematic maps, diagrammatic atlases), and hybrid repositories. The paramount value lies not solely in surveying extant scholarship but in excavating innovative methods concealed within it.¹³

The exploration manifests through data layering: superimposing thematic overlays from disparate literatures to expand keyword pools, construct emergent connections, and fortify hierarchies rooted in initial research objectives and questions. Such synthesis transcends summary and existing methodological propositions to propel conclusions beyond conventional bounds, elevating research rigour and originality.

Ultimately, a robust literature review self-generates trajectories: it proposes personalised methodologies and findings, iteratively refining the study's quality from its inception.¹⁴ The following chart presents a preliminary idea of a typical literature review diagram that could be further developed by summarising the key ideas and keywords from each resource and overlaying them with existing knowledge.

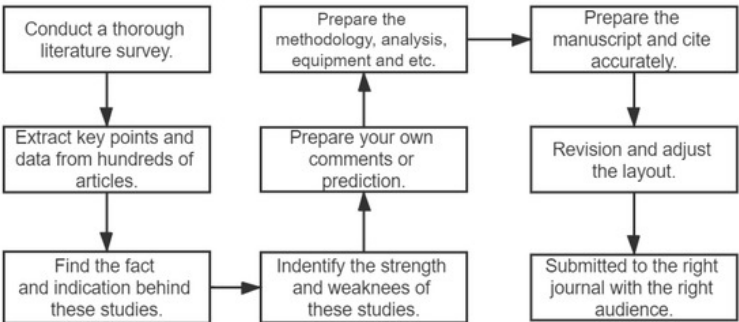


Figure 7. Guidelines for writing a Review Article. 15

Data and Conclusions

Research data are primarily derived through qualitative or quantitative methods. In each case, the data is mostly raw and ideally numerical. In most cases, the depth of research is defined by the breadth of the data accumulated. While modern technology has greatly eased the process of data collection, it is in the representation, articulation, and analysis of data that technology plays an integral role. However, the imperative question is how to select the method, tool, and software to organise and examine the information set. Perception of data is extremely important in this case. Perception here emphasises the imagination and ideation of data in hierarchies, forming connections and links that could be used to arrange and begin building arguments based on the composition of information collected. The most effective method to develop connections while tabulating data is to overlap various visual tools as core to the formulation of arguments or connections. Hence, data invites a creative approach to visualisation and the use of its tools. The following figure demonstrates how the overlay of lines, arrows, or even colour coding can change the data at the early stages of research.

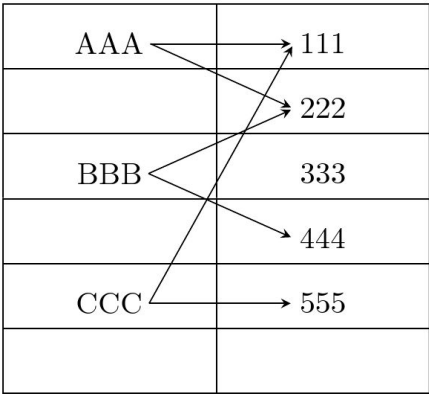


Figure 8. (Random example) Developing data through visual tools¹⁶

Similarly, conclusions often hint at and target real scenarios; however, they repeatedly lack the image representation needed to connect the end to the start. Visual aids can play a critical role in this case. If the research is imagined from beginning to end as a series of links, where one step leads to another, the conclusion automatically recalls the beginning. It can also embed all study steps using various tools.

CONCLUSION

Over time, research has relied on text as the primary medium, from conceptualisation and data collection to analysis and even conclusion, often highlighting linear narratives over holistic comprehension. However, this text-centric paradigm overlooks the advantages of visuals, which process information up to 60,000 times faster than text and enhance retention by 400% through pattern recognition and spatial mapping. Shifting toward visual dependency and articulation redefines research as a multimodal process, where diagrams, maps, infographics, and dynamic models serve as analytical tools rather than afterthoughts.¹⁷

Visuals must transcend mere presentation aids to be fully embedded in the research process: they articulate ambiguous ideas during ideation (e.g., sketching urban morphologies), conduct exploratory analysis, and formulate arguments (e.g., layered diagrams that synthesise theory and other data). This approach promotes a deeper understanding by engaging with multiple-coding theory, in which visual and verbal tools reinforce each other for greater insight.¹⁸

Importantly, this does not advocate replacing text with visuals but harnessing their parallel vitality: text provides precision and argumentation, while visuals offer immediacy and synthesis at every research level. Hybrid workflows, such as annotated diagrams paired with footnotes, ensure consistency without compromising accessibility, thereby enhancing impact across interdisciplinary contexts and research domains.¹⁹

NOTES

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OF NODES AND EDGES: KNOWLEDGE GRAPHS AND THE RELATIONAL TEACHING OF NATIONAL IDENTITY IN ARTS AND CULTURE HIGHER EDUCATION

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INTRODUCTION

In recent years, there have been indications of a shift in political preferences in the Netherlands toward the right. This development is reflected in the outcomes of recent national elections, in which a significant share of voters supported right-wing parties.¹ This brings challenges in terms of discussing national culture and identity for both students and teachers in higher education. These discussions can become emotionally charged, particularly when students and teachers bring diverse cultural backgrounds, political preferences and personal experiences into the classroom. Creating pedagogical environments in which controversial or sensitive topics can be addressed in a safe and respectful manner has therefore become increasingly important. In addition, in our teaching we have observed a growing disconnect between existing theoretical frameworks of national identity in relation to arts and culture and the lived experiences of our students in the BA Media, Art, Design and Architecture (MADA) at the Vrije Universiteit Amsterdam. In both formal and informal evaluations and in seminar discussions, students have indicated that national identity theories presented through *essentialist* and *constructivist* paradigms can feel overly polarised and abstract, and do not always reflect the lived complexities of their own identities and cultural backgrounds. At the same time, students expressed uncertainty about whether the theories, methods, and tools they are learning, will support their future employability in an increasingly digital and globalised job market. This paper presents the findings of a pilot study that was carried out in the first-year course *The NetherlandsTM* in 2024-2025. In this pilot, we collaborated with students to explore how digital ‘knowledge graphs’ can be used to visually map overlaps and tensions between essentialist and constructivist narratives of national culture, how such tools might inform the development of new, less polarising theories of national culture and forms of teaching them. The paper presents the main insights from the pilot while discussing how digital tools can contribute to (co)creating less polarising approaches to national identity, with the aim of developing more inclusive, relevant, and future-facing learning experiences for both students and teachers.

ESSENTIALIST AND CONSTRUCTIVIST APPROACHES TO NATIONAL IDENTITY

National identity in arts and culture is often approached from an essentialist perspective, which is rooted in the idea that nation-states are defined by a shared and enduring cultural core, that is expressed through common ancestry, language, territory, traditions, and heritage. Within this

approach, the nation is perceived as a coherent cultural community, whose artistic and cultural expressions are seen as manifestations of this underlying ‘essence’.² However, the essentialist approach narrows understandings of national identity by excluding people as well as their material and visual culture that do not align with its notions of ‘authenticity’. Moreover, essentialism functions as a closed loop, in which national identity explains the ‘typical’ features of visual and material culture, while those features are simultaneously used to define and legitimise national identity. For example, in the Dutch context, the flat polder landscape is often cited as an explanation for Mondriaan’s geometric abstraction, and vice versa: his paintings, in turn, are presented as reflections of the characteristic Dutch landscape.³

In contrast, a range of approaches challenge the essentialist view of national identity.⁴ Collectively referred to as constructivist theories, they argue that national identity is actively produced by various actors, each shaped by their own interests and agendas.⁵ From a constructivist perspective, Mondriaan’s geometric and abstract paintings would not be understood as natural expressions of the Dutch polder landscape, but as products of specific historical and intellectual contexts. His shift toward abstraction, for example, could also be understood in relation to transnational avant-garde networks, the influence of theosophy, and (then) contemporary modernist debates on form, spirituality, and universal harmony.⁶

At the same time, constructivist approaches have their own limitations, in the sense that they can overstate the degree to which national identity is consciously constructed or readily transformed.⁷ Since national identity often develops through long-term historical processes, the enduring influence of material conditions, economic interests, and coercive power in sustaining or reshaping political orders is frequently overlooked. A more balanced perspective therefore recognises that national identity is also shaped by structural constraints and unintended historical developments.⁸

VISUALISING NATIONAL IDENTITY THROUGH KNOWLEDGE GRAPHS

The theoretical tensions and pedagogical challenges outlined above give rise to three specific concerns in our teaching practice. First, there is an urgent need to develop and integrate new didactic methods into the course that are grounded in the construction of safe environments or ‘safe spaces’,⁹ in which students and teachers feel secure enough to discuss controversial topics, such as (Dutch) national identity. Second, new pedagogical approaches must be developed and embedded in the course that promote inclusivity, meaning that they take into account the perspectives and lived experiences of individuals.¹⁰ Third, it is necessary to explore and/or develop new, less polarising theoretical frameworks that can address the topic of (Dutch) national identity in a more inclusive manner.¹¹

As MADA positions itself as a programme that engages with urgent contemporary issues, it is important that (Dutch) national and cultural identity can (still) be openly discussed within our curriculum. We see the development of new, safer, and more inclusive (theoretical) reference frameworks and corresponding teaching methods as a promising way forward. Knowledge graphs (KGs), which visually map relationships between concepts, theories, events, and experiences,¹² may offer an effective tool to address these challenges, as they make the complexity of national identity explicit without reducing it to binary or polarised positions (see figure 1 for an example). Furthermore, KGs can support conceptual understanding by externalising connections between ideas and encouraging exploratory learning.¹³

From a knowledge-building perspective, shared representations of concepts and ideas, such as KGs, can support collective inquiry by presenting concepts of (Dutch) national identity as being open to revision and development, rather than being fixed expressions of individual, collective or theoretical opinions.¹⁴ In this way, KGs can serve as tools that help students to jointly explore, question, and

refine relationships between concepts. Instead of framing perspectives as positions to be defended, knowledge graphs can encourage students to engage in a process of collaborative meaning-making and ongoing knowledge development, thereby supporting more reflective, dialogic and constructive approaches to national identity.

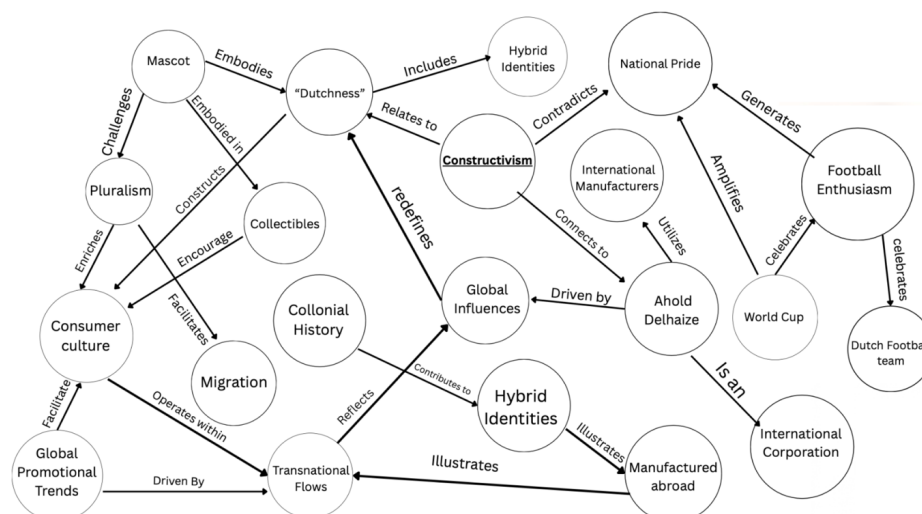


Figure 1. A knowledge graph (constructivist perspective) by one of the student groups. Topic: Albert Heijn supermarket 'Hamster' campaign

METHODOLOGY

The pilot study was conducted in June 2025, during the first-year course *The NetherlandsTM*, where students formed groups of four or five, and selected a self-chosen 'typically Dutch' artefact related to media, art, design, or architecture. For example, a Heineken tv-commercial (media), a Van Gogh painting (art), a Delftware vase (design) or a building designed by Berlage (architecture). During the lectures, students were introduced to the theoretical foundations of the essentialist and constructivist approaches to national identity. In subsequent seminars, students constructed KGs of people, places, objects, events or concepts related to their objects, and first interpreted these KGs using an essentialist interpretation, followed by a constructivist interpretation. If students chose to do so, they could also construct additional KGs that they could use for alternative interpretations that were not related to either essentialism or constructivism.

To support this process, students worked with detailed, step-by-step worksheets that guide them through identifying the "nodes" (concepts) and "edges" (relationships), translating these into datasets, and visualising them as knowledge graphs using the Gephi software. Students were free to use other digital tools or construct their graphs manually. Before working on their own artefacts, students first practised the method using a mock object to familiarise themselves with the workflow and underlying concepts. The constructed KGs could then be used as a basis for writing essays on an essentialist and constructivist interpretations of their object, respectively. The final assessment consists of a 10-minute vlog in which students presented and reflected on the essentialist, constructivist, and if they chose to do so, alternative interpretations of their chosen artefact.

The data for this study was collected during the course through in-class observations and conversations with students, submitted worksheets and essays, and semi-structured group interviews with 15 project groups (approximately 60 students in total) during the final session. The interviews focused on students' experiences with constructing knowledge graphs, the usefulness of the instructional worksheets, the perceived relevance of digital humanities tools, and suggestions for

improvement. Particular attention was paid to how students understood the relationship between the knowledge graph process and the essentialist and constructivist frameworks discussed in the course. The collected data was analysed using a thematic analysis approach. During this process, the research data was systematically coded, according to recurring concepts, experiences, and evaluations.¹⁵ These initial codes were then compared, grouped, and refined into broader categories from which six themes were constructed. The themes relate to (1) the perceived value of the knowledge graph construction process, (2) the complexity of the software used, (3) the structure and ambition of instructional materials, (4) the integration of knowledge graphs into assessment, (5) the relevance of digital humanities skills, and (6) students' varying levels of digital literacy.

FINDINGS

The thematic analysis identified six overarching themes that illustrate both the pedagogical potential and the practical challenges of integrating knowledge graphs (KGs) into the course.

1. The process of constructing the KGs was perceived as valuable

Across groups, students emphasised that the process of constructing the KG (i.e. identifying nodes, defining edges, and establishing connections) was particularly valuable. Many described how mapping relationships helped them recognise “how many different factors go into the artefact” and enabled them to “see the bigger picture.” The act of linking concepts encouraged more detailed reflection and, in some cases, brought to light previously unnoticed “islands” of information.

Although some students indicated that the theoretical distinction between essentialism and constructivism had already become clear through lectures, the KG proved especially useful in translating these frameworks into analytical practice. By constructing separate knowledge graphs for their artefact from both an essentialist and a constructivist perspective, students were able to compare the resulting structures visually. Several groups observed that the essentialist graph tended to contain fewer nodes and more linear connections, while the constructivist graph was often more expansive and multi-layered. This visual contrast made tangible the relative narrowness of the essentialist interpretation and helped students recognise its analytical limitations. In this sense, the knowledge graph functioned not only as an effective structuring and communication tool, but also as a means of critically interrogating theoretical perspectives through visual comparison, supporting the application and articulation of theoretical insights rather than serving as the primary source of conceptual understanding.

2. Students embraced visual mapping, exploring different tools to support it

A recurring theme concerned students' experiences with learning to use Gephi. While several groups became comfortable with the software over time, others noted that it required an initial investment in understanding its interface and functionalities. Practical aspects such as adjusting labels, layouts, and exporting their knowledge graphs occasionally demanded additional time and attention, which influenced how smoothly the conceptual work progressed.

In some cases, groups chose to experiment with alternative tools such as Canva, PowerPoint, or hand-drawn mind maps, particularly when working with relatively small datasets. Importantly, this did not reflect resistance to network-based thinking. On the contrary, students consistently expressed appreciation for visual mapping and relational analysis. Rather, their feedback suggests that the choice of software plays a significant role in shaping the learning experience, especially for students with varying levels of digital confidence.

3. Structured worksheets enabled students to internalise the method

The worksheets were widely appreciated for their clarity and logical progression. Students valued the step-by-step guidance, particularly in translating theoretical concepts into nodes, triplets, and relational tables, which are necessary to construct a KG. Moreover, the structured format supported collaboration and helped clarify expectations for assignments.

As students became more familiar with the method, some groups began to experience the process as somewhat repetitive, especially where similar steps were applied to both essentialist and constructivist interpretations. At the same time, several groups explicitly indicated that they would have welcomed a more ambitious and multi-layered exploration of their artefacts and the theoretical frameworks. This suggests that while the scaffolding successfully supported initial learning and skill acquisition, there is pedagogical potential to introduce greater autonomy, analytical depth, and complexity in later stages of the course.

4. The KG proved most effective when integrated early in the analytical process

Students' experiences with the integration of the KG into the final assignments varied. While some groups constructed their essays before finalising the KG, others used the graph more explicitly as a tool to organise arguments and structure their vlog. In cases where the KG was engaged with early in the process, students described it as particularly helpful in clarifying their analytical approach and identifying key relationships within their material.

These findings suggest that the pedagogical potential of the KG is strongest when it is clearly positioned as a foundational step in theory-building and assessment. Making its analytical role more explicit within the assignment design may further strengthen the alignment between method and outcome, ensuring that the KG functions not only as a visual product but as a central instrument in shaping students' reasoning.

5. Students recognised the broader relevance of digital humanities skills

Students expressed generally positive views about the relevance of digital humanities tools, such as knowledge graphs, for their future careers. Many recognised that digital competencies are increasingly important within a technology-driven cultural landscape and appreciated being introduced to methods that extend beyond traditional humanities approaches. The guest lectures by experts from the field of digital humanities in the beginning of the course were frequently mentioned as particularly valuable in demonstrating the broader applicability of digital methods and situating the course within contemporary professional contexts.

Despite the fact that students differed in whether they envisioned using Gephi specifically in their own future practice, many found that the underlying mindset of “connecting the dots” and thinking relationally was valuable. In this sense, the course not only introduced a specific tool, but also introduced a way of thinking that students perceived as relevant across a range of academic and professional settings.

6. Digital Literacy and Confidence Gaps

Finally, the interviews highlighted variation in students' levels of digital confidence: some students navigated Gephi with relative ease, whereas others were encountering this type of software for the first time. Several groups expressed interest in clearer demonstrations, additional in-person guidance, or introductory sessions on digital skills, indicating an awareness of the importance of building a stronger technical foundation.

These differences shaped how students engaged with the KG exercise. For many, working with the software was both intellectually stimulating and skill-enhancing; for others, it was more challenging,

but nonetheless presented an opportunity to expand their digital competencies. The findings suggest that providing additional structured support at the outset could further strengthen students' confidence and maximise the pedagogical impact of integrating digital humanities tools into the curriculum.

DISCUSSION AND CONCLUSION

This pilot study aimed to explore how knowledge graphs (KGs) can be integrated into theory-building and teaching practices in order to update the discussion of national identity in arts and culture education to our current political context. The findings suggest that KGs hold significant pedagogical potential, particularly as process-oriented tools that support relational thinking, collaborative inquiry, and the application of theoretical frameworks. The strong emphasis students placed on the value of constructing the KGs indicates that they function less as final (visual) products and more as cognitive scaffolds. Furthermore, by constructing the KG, were encouraged to externalise and structure their reasoning, and operationalised abstract distinctions between essentialist and constructivist perspectives, thereby bridging the gap between theory and analysis.

A key insight was that creating both an essentialist and a constructivist KG for the same artefact enabled students to grasp the limitations of both essentialist and constructivist perspectives more concretely. The visual comparison highlighted how both frameworks required the exclusion of certain aspects related to the artefact. In this way, the KG not only supported the understanding and application of theory but also facilitated critical reflection on the limitations of currently predominant theories of national identity.

Even though students embraced visual and relational mapping, their experiences were largely shaped by the accessibility of the software and their levels of digital confidence. This confirms that the successful integration of digital humanities methods depends not only on conceptual design but also on careful technical scaffolding and inclusive (digital) support structures. An important finding was that students appeared to be open towards network thinking, provided that there is an alignment between pedagogical aims, choice of software, support towards learning how to use the software, and assessment.

Students' desire for more ambitious explorations of both the software and of theories of national identity in relation to cultural artefacts suggests that once the digital method is internalised, students are ready to move beyond structured scaffolding toward more autonomous and layered interpretations. This reflects the productive tension between guidance and autonomy in inclusive classroom design. If KGs are to contribute to less polarising approaches to national identity, they must therefore remain flexible enough to accommodate multiplicity, contradiction, and alternative readings, moving beyond simply reproducing essentialist and constructivist binaries.

The pilot indicates that KGs have the potential to support safer and more dialogic discussions about national identity in relation to arts and culture by shifting focus from personal positions to discovering relational structures. Although this study does not claim that KGs automatically produce safe spaces, it suggests that they can function as mediating tools that externalise and distribute ownership of ideas, thereby facilitating more constructive and reflective exchanges.

ACKNOWLEDGEMENTS

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INTERDISCIPLINARY TEACHING ACROSS MEDIA, ARCHITECTURE, ART, AND DESIGN: FROM INSTITUTIONAL CONSTRAINS TO CREATIVE SYNERGIES

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INTRODUCTION

Our programme, the Media, Art, Design and Architecture (MKDA being the Dutch acronym) BA in the Faculty of Humanities and Social Sciences of Vrije Universiteit Amsterdam (VU), offers an ideal setting for exploring the challenges and potentials of interdisciplinary and inter-institutional teaching in higher education. Consensus exists on the potential of interdisciplinary and interinstitutional collaborations to enrich research and pedagogy, yet the way institutional environments can encourage them is not adequately researched.¹

To define interdisciplinarity, we build on Klein who writes, “unlike multidisciplinary, which is additive, interdisciplinarity is integrative: knowledge of different disciplines is contrasted and changed by integration”.² Accordingly, by interdisciplinary education we refer to an approach that integrates knowledge, theories and methods from different disciplines to teach a particular topic. By inter-institutional education we refer to the situation where non-permanent academic staff from other institutions are temporarily brought in to support the permanent staff through teaching and supervision. This is a broader term: Ripoll-Soler and Molina argue that indeed the paucity of resources in higher education “has accelerated this process of inter-institutional collaboration in a large number of countries.”³ Additionally in MKDA the coexistence of academic teachers and teachers-creative practitioners add complexity to the meeting of different teaching and learning epistemologies.⁴

MKDA is a three-year BA programme. During the first year, students attend broad interdisciplinary core courses in Art and Culture; they then choose a specialization and follow discipline-specific courses in the second year; and in the third year they broaden again by following a minor or an internship, and then write their thesis.⁵ To offer a coherent programme, scholars of the four scientific areas (Media, Art, Design and Architecture) therefore often must work together to understand the commonalities and intrinsic differences between the four realms of cultural production and the evolution of the respective fields of study. Transdisciplinarity is also present, as scholars and teachers maintain close contact with (or even double as) practitioners: designers, artists, architects, or filmmakers.

Recent political developments in the country and beyond have led to widespread interventions in academia, such as budget cuts and mergers at various levels. Interdisciplinarity and inter-institutional collaboration have emerged as imposed, extrinsic necessities in this context, created for example by

financial constraints to fund (small-scale) monodisciplinary teaching – rather than being intrinsically motivated choices guided by the programme’s aims and students’ choices. MKDA’s interdisciplinary institutional structure can provide examples of how extrinsically motivated interdisciplinarity and inter-institutional teaching in higher education can be transformed into reflexive, intrinsically motivated assets.

As a case study of how interdisciplinarity and inter-institutional teaching can intentionally enhance higher education, this paper explores thesis supervision within MKDA’s Design track. While any of the other tracks could also have been chosen for this study, the Design track is particularly suitable because it has ample experience of collaboration with colleagues from other disciplines and institutions. Within that context, we, the authors, spanning Design Cultures and Heritage Studies, have experienced firsthand that interdisciplinary and interinstitutional supervision is not straightforward, however. Indeed, there is a gap of knowledge in the literature on interdisciplinary thesis supervision, which targets graduate and PhD supervision but largely omits interdisciplinary under-graduate programmes.⁶

To address these challenges and literature gap, we initiated our project *Addressing Challenges and Uncovering Opportunities in Interdisciplinary and Inter-Institutional Education*, funded by a Scholarship by the Vrije Universiteit’s Centre for Teaching and Learning.⁷ Specifically, we ran a pilot aiming to enhance and learn interdisciplinary and inter-institutional lessons from MKDA’s Design track thesis supervision in 2024-2025. This paper reports on the findings of this pilot.

APPROACH AND METHODS

Our research adopts an iterative, intervention-driven design-based research (DBR) approach.⁸ In this framework, inquiry proceeds through successive cycles in which challenges are identified, interventions are designed and piloted, and their effectiveness is evaluated and refined. Early insights shape subsequent cycles, ensuring that the research remains adaptive and responsive to emerging findings.

Guided by this approach, the study was structured into four research questions about interdisciplinary and transdisciplinary supervision within the BA Design thesis context:

- RQ1. What are the key challenges perceived by supervisors in interdisciplinary supervision of Design BA theses at VU?
- RQ2. What are the key challenges perceived by supervisors in inter-institutional supervision of Design BA theses at VU?
- RQ3. What potential interventions can be implemented to address the challenges identified in the inter-institutional and interdisciplinary supervision of Design BA theses?
- RQ4. To what extent are the challenges and interventions identified in interdisciplinary and inter-institutional BA Design thesis supervision applicable to thesis supervision in other disciplines and at other levels?

We organised research into these questions into three main stages: identifying supervision-related challenges (RQ1 and RQ2); implementing targeted interventions to address them (RQ3); and generalizing the resulting insights for broader applicability (RQ4).

To examine the prevalence and severity of the identified challenges, we employed a mixed-methods design that combined semi-structured interviews, a Likert- scale survey,⁹ and observational data. Interviews were conducted with four focus groups: VU Design supervisors; VU supervisors from other disciplines; Design supervisors from other institutions; and thesis coordinators from other MKDA tracks (namely, Media, Art and Architecture). A Likert-scale survey was administered to determine which approaches or solutions were perceived as most useful. Observational notes collected throughout the intervention cycles provided additional contextual information. All qualitative data

were analysed through thematic coding informed by grounded theory, followed by a thematic analysis to synthesize patterns across the datasets.¹⁰

In the following sections, we detail each stage of the study, outlining the procedures, interventions, and analytical steps involved. We then present the key findings generated across cycles, showing how the DBR approach informed the development and refinement of interventions and contributed to broader insights into interdisciplinary and transdisciplinary supervision practices.

IDENTIFYING CHALLENGES AND LESSONS

Interdisciplinarity is at the core of MKDA. Yet, there is a lack of pedagogical research concerning interdisciplinary thesis supervision at BA level. This is problematic because BA supervision is fundamentally different from MA/PhD supervision, for example in terms of timeline and structure.

Advancing from our research design, we started by addressing our two main questions, namely: RQ1. What are the key challenges perceived by supervisors in *interdisciplinary* supervision of Design BA theses at VU? and RQ2. What are the key challenges perceived by supervisors in *inter-institutional* supervision of Design BA theses at VU?

We identify four key types of challenges that supervisors perceived in interdisciplinary and inter-institutional BA Design thesis supervision at the VU:

1. Disciplinary knowledge

Both inter-institutional design supervisors and interdisciplinary VU supervisors often cannot have a full picture of the methods, theories, historical periods, and case studies that VU's design students have been taught during their studies. Both supervisor groups also experience some uncertainty about how VU design students understand the academic field of design. Additionally, interdisciplinary VU supervisors understandably do not have a comprehensive overview of the literature in design-specific topics.

2. Diverging disciplinary cultures

Both inter-institutional design supervisors and interdisciplinary VU supervisors experience different grading cultures and expectations in terms of communication, as well as “unwritten institutional and disciplinary rules.”

3. Administrative structures

Both inter-institutional design supervisors and interdisciplinary VU supervisors note the importance of central coordination in thesis supervision, a lack of which can result in a struggle for both parties. Inter-institutional design supervisors often note how administrative rigidity, for example in terms of thesis contracts and work plans, can often feel as a barrier to progress.

4. Communication and coordination

Both inter-institutional design supervisors and interdisciplinary VU supervisors mention the importance of aligning expectations at the start of the thesis writing process as well as shared interpretive frameworks concerning thesis components. In other words, while as Humanities scholars all supervisors are familiar with thesis sections such as “introduction,” “literature review,” “theoretical framework,” “methods,” “analysis,” “discussion” and “conclusion,” expectations regarding what each of those should contain and deliver, as well as their positioning and function in the thesis, can differ substantially. However, this difference in interpretation can often go unnoticed (because everyone thinks they are talking about the same thing when discussing, for example, “theoretical framework”) while staying unperceived as a cause of confusion.

INTERVENING

The second phase in our approach was addressing RQ3. What potential interventions can be implemented to address the main challenges and enhance the lessons identified in the inter-institutional and interdisciplinary supervision of design BA theses? This involved designing, developing, and implementing targeted interventions to address the identified challenges and to enhance the process based on lessons learned. We established methods to assess the effectiveness and feasibility of the interventions, by testing and refining them, and gathering feedback from supervisors and track coordinators. Next, we discuss four such interventions:

First, we organised meeting moments between the interdisciplinary cohort of supervisors. Starting before the beginning of the thesis trajectory, these meetings aimed to ensure everyone knows their co-supervisors, and to provide a space for questions, clarifications, peer discussion, and knowledge-sharing, ultimately fostering collaboration and reducing uncertainty; the provision of such a safe space characterised by supportive colleagues aligns with the findings of previous research on successful inter- and trans-disciplinary education.¹¹ In our case, these meetings also served as moments of feedback on our interventions, allowing for minor refinements during implementation and ensuring consensus.

Second, we developed and distributed a thesis manual for supervisors' teams to outline key information about the thesis trajectory, aimed to improve alignment and calibrate expectations for all supervisors. The manual outlines key dates, submission procedures, and standard supervisory practices. Perhaps most, importantly, it gives explicit explanations of each thesis component: the introduction, literature review, conceptual framework, methodology, analysis, and discussion or conclusion. The focus of the manual is indeed on defining the function of each thesis section, but not on enforcing a rigid structure: it ensures all theses remain comparable while allowing (inter)disciplinary flexibility according to the aims of the student and the disciplinary conventions practiced by the supervisor. In other words, supervisors and students can interpret sections based on disciplinary perspectives as long as they clearly define their approach. This intervention proved equally effective for both interdisciplinary and inter-institutional supervision. It showed clearly that many of the challenges of interdisciplinarity can be avoided by employing clear and explicit explanations and guidelines, instead of taking for granted approaches originating from specific disciplines.

Third, we introduced the possibility for one or more consultation sessions between the primary supervisor and second reader *before* the thesis contract is signed. This step proved successful as a means to ensure alignment regarding the interpretation of thesis components and expectations before supervision begins – and also to preempt misalignments at evaluation. It ensured smoother collaboration and a coherent stance between supervisors from different institutions and addressed interdisciplinary challenges on their onset, prioritising the benefit of the student and the quality of their work.

Fourth, we introduced a thesis calibration session towards the end of the trajectory, attended by all supervisors, aimed for discussion and alignment of expectations about evaluation, research approaches, and assessment criteria. The need for integration and common definitions is also highlighted as a key guiding principle “for the design and execution of a constructive alignment in interdisciplinary/ transdisciplinary education.”¹² Our 2025 thesis calibration session was a structured session with eight colleagues, grading an anonymised thesis from a recent graduate, and thoroughly discussing each component of the assessment rubric. This intervention established a shared understanding of thesis quality standards regardless of interdisciplinary and inter-institutional differences, ensuring that students are graded consistently.

GENERALISABILITY AND SCALABILITY

The last phase of our project addressed our last research question: RQ4. To what extent are the challenges, lessons and interventions identified in interdisciplinary and inter-institutional BA Design thesis supervision applicable to thesis supervision in other disciplines and at other levels? In this phase, we aimed to examine whether the identified challenges, lessons and interventions could (and should) apply beyond Design BA theses to other disciplines and educational levels.

The first level of upscaling was naturally in the context of our BA programme itself. We thus carried out an additional focus group with the four coordinators of the four tracks Media, Art, Design, and Architecture, where our colleagues were asked to share their experiences, views, and ideas regarding thesis supervision and, more broadly, interdisciplinary and inter-institutional collaborations in teaching.

The results of this focus group showed how, across MKDA, interdisciplinarity is valued as intrinsic (motivated by the interests of students and needs of the research topic) rather than instrumental (forced by institutional constraints). Colleagues agreed that an interdisciplinary thesis process can be smooth by ensuring it remains structured yet flexible, e.g. in interpreting thesis components or allowing room for pivoting. Once again, explicit interpretations of the components were deemed crucial in an interdisciplinary context: students and supervisors should have thorough discussions about the objectives and forms of thesis components rather than assume shared understandings. This step also allows supervisors from other disciplines or institutions to step in responsibly, without having a thorough knowledge of the entire MKDA programme. Lastly, this group also stressed the importance of periodic and structured communication among supervisors particularly in interdisciplinary and transdisciplinary teams.

Following this discussion, and a number of ‘coffee-corner’ encounters with other colleagues that showed the relevance of this project beyond our specific thesis trajectory, we envision two additional interventions in the BA thesis process, to be adopted in a programme-wide scale (and potentially to be disseminated in other programmes in the Faculty of Social Sciences and Humanities who work with interdisciplinary and inter-institutional teaching).

First, we propose the creation of a “knowledge guide”: a reference document for both students and supervisors created with the purpose of summarising what students have learned throughout the entire MKDA programme that is essential for their thesis (e.g. regarding use of concepts, methods, and academic writing). Such a guide can help students recall prior knowledge and provide supervisors (especially from other institutions or disciplines) with a more thorough knowledge regarding students’ academic background. Such a guide would help interdisciplinary supervisors to better understand how design students conceptualise their work, while giving inter-institutional supervisors a firmer grasp on what knowledge students bring from the MKDA curriculum.

Second, to enhance intrinsic interdisciplinarity, we imagine a structured way to encourage interdisciplinary ‘matches’ between students and supervisors by providing simple ‘profiles’ of all available supervisors, accompanied by keywords of their research interests. In a sort of student-led matchmaking, students can then ‘anchor’ their ideas to supervisors’ interests and instrumentalise their interdisciplinary skillsets to come up with more creative topics and complex research questions. “Interdisciplinary matchmaking” enhances a situation where interdisciplinarity stems from students’ and teachers’ inherent interests and curiosity and the needs of the research topic itself, even if being extrinsically initiated from institutional and financial constraints.

CONCLUSIONS

A direct conclusion about our research project is that our iterative methodology including focus groups, interventions, and proposals for scalability, proved successful in identifying challenges and amplifying best practices in interdisciplinary and inter-institutional thesis supervision in MKDA's Design track. More broadly, we see ample potential and intention to generalise these findings further, targeting interdisciplinary collaborations but also transdisciplinarity, as the recent faculty merge of Social Sciences, Humanities, and Religion and Theology brings us in contact with colleagues outside the Humanities, each with their own disciplinary baggage (approaches, methods, intrinsic assumptions, and practices).

In terms of the specific area of Arts and Culture, our project shows the potential to build protocols of transdisciplinary supervision and teaching, taking into account the contact of faculty members with practitioners, and often their double role as practitioners themselves (Artistic research, research by design, etc).

Finally, reflecting on a general tendency to mergers and budget cuts threatening academia, threats to which we, as Humanities scholars, are disproportionately susceptible, it becomes clear that we should combine our resistance with structured pathways to 'do' interdisciplinarity and transdisciplinarity on our own terms. Indeed, through the results of our projects, we conclude that it is necessary to develop clearer guidelines that address implicit and tacit disciplinary cultures of teaching and supervising. Such an approach, based on targeted discussions and explicating assumptions stemming from disciplinary traditions, can even be seen as a survival strategy that can relieve pressure and forge strong alliances that can allow us to both support each other better, and to be more empowered to conduct societally relevant research and teaching. MKDA's Design track thesis supervision offered many insights regarding strategies to this end.

These reflections make our findings relevant for their potential to enhance innovation and creativity across Art and Culture higher education. Our small project is an example of how we can go 'from accident to intention', in turning challenges brought by institutional and financial constraints into opportunities for better teaching and learning. Programmes such as our BA Media, Architecture, Art, and Design, melting pots of different disciplines and approaches, can become living labs for such a tur

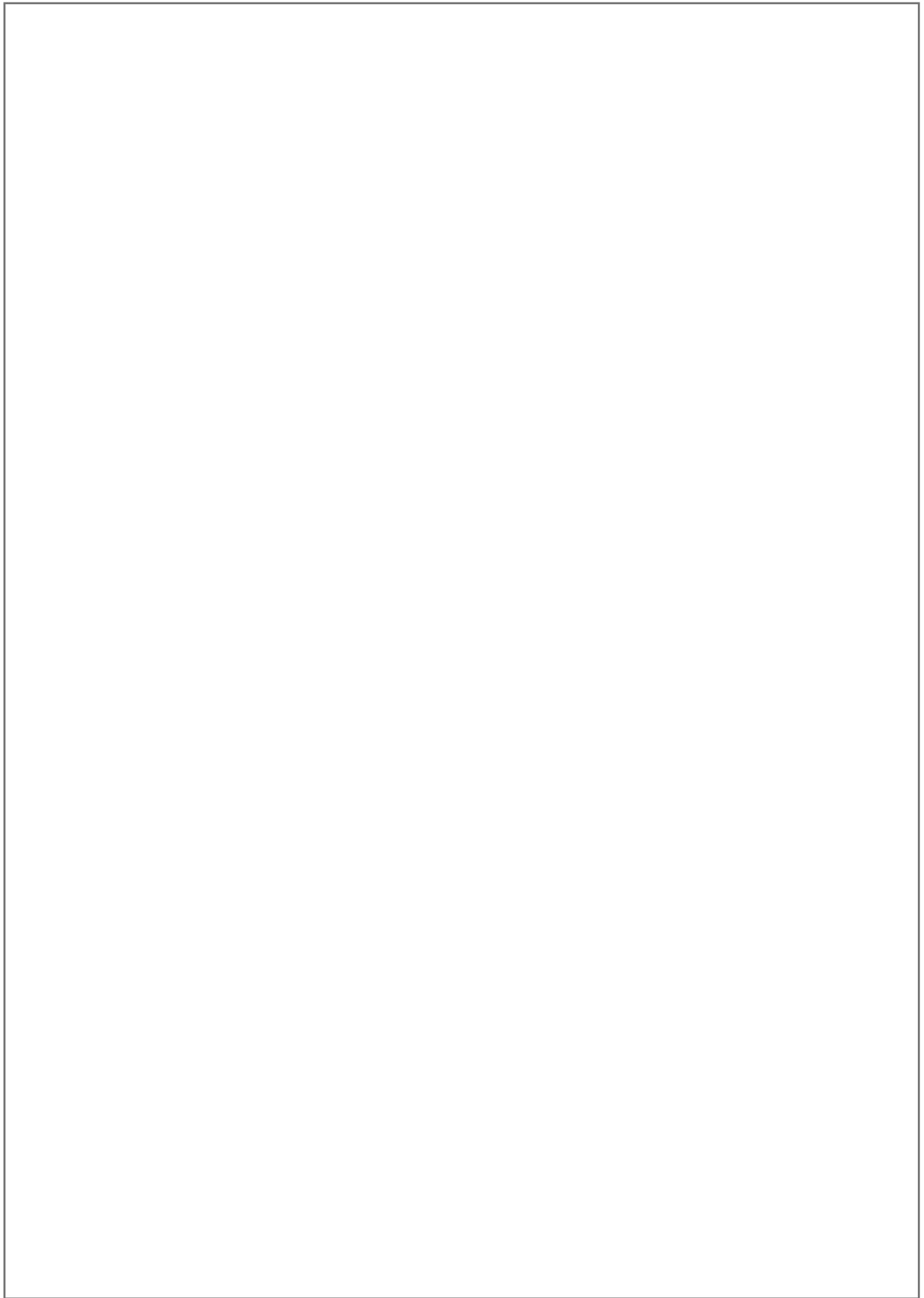
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