shift Deck

Pragmatic Design
Pedagogy Interventions
for Climate Resilience

For Quinn

Cindy Raspiller
SJSU MDes XD 2025


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SYSTEMS & TRANSITIONS
Objective: Students will be able to apply systems thinking and circular design principles to their work, recognizing and embracing the complexity of the interdependent environmental, economic, social, and technical systems their work is a part of. They understand the consequences of the design field on interrelated ecosystems, and identify interventions for positive change.
ENGAGEMENT WITH POLICY
Objective: Students will recognize relationships between design and policy, and advocate for and support environmental and climate policy through design. They will assess how their design practice can align with civic, cultural, and environmental climate goals.
TRANS-DISCIPLINARY
Objective: Students of design collaborate across disciplines, integrating innovative scientific, environmental, and sociological research and diverse perspectives into their design processes. They approach complex challenges with a multi-disciplinary mindset, leveraging methodologies such as co-design and participatory design to co-create impactful and sustainable design solutions.
HYPER-LOCALIZATION
Objective: Students understand that the biggest impact they can make in climate resilience is in their immediate community, and are familiar with the local
ECONOMY
Objective: Students will be able to manage visual, physical, and digital assets for the purpose of resource sustainability. They will assess and utilize methods for sustainable ink and paper usage, digital carbon footprint measurement, and can justify design solutions based on economy of use and impact.

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Pragmatic design pedagogy interventions for climate resilience

A thesis project presented in partial fulfillment of the requirements for the degree of Master of Design with a specialization in Experience Design at San José State University in San José, California.

THESIS COMMITTEE

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Pragmatic means this project is useful, efficient, reasonable—in a word, practical. The methods in this deck are meant to complement pedagogy already in place. By framing these methods as pragmatic, I am introducing climate resilient design methodology as a conventional part of design pedagogy.

Design Pedagogy refers to the methods, activities, and instruction involved in postsecondary visual communication design teaching. Pedagogy refers to how concepts are taught, why they are taught, and how to assess learning.

Interventions are intentional actions to change something for the better.

For implies in service or promotion of.

Climate Resilience is defined by the US EPA as the capacity of a system to maintain function in the face of stresses imposed by climate change and to adapt the system to be better prepared for future climate impacts.[1] Climate change is our new normal. Between 2030 and 2050, we can expect approximately 250,000 additional deaths per year that can be attributed to the effects of climate change.[2] We need to adapt our ways of being—our ways of designing—to this new normal. ***Our design culture must be one that thrives in the face of turbulent change.***

[1] "Definitions | US EPA," US EPA, February 13, 2025, https://www.epa.gov/resilient-investments/definitions.

[2] World Health Organization: WHO, "Climate Change," August 9, 2019, https://www.who.int/health-topics/climate-change#tab=tab_1.

“When we create, we have agency in a world that says we are too small to enact change.”

– “The case for making art when the world is on fire,”
Amie McNee, TEDx Manchester, March 1, 2025

THESIS ABSTRACT

Statement

Tomorrow’s design leaders will need to be resilient in the face of tumultuous change. Today’s students are ready to take on the environmental challenges of their time, and their design education must reflect that. The Shift Deck empowers educators to spark change through a practical framework of small but powerful shifts towards climate resilient design techniques that enrich student projects, empowering the next generation of designers to lead the transformation our world needs.

Abstract

A growing cadre of designers are advocating for circular economies, responsible design choices, and life-centered design models. Students of design feel a disconnect between the skills they are taught and the complexity of problems facing the planet, and are not often aware of climate resilient design methodology until well after they have entered the workforce. This creates a gap in action that the design industry cannot afford.

To design climate resilience into our companies, communities, and governments designers need to be aware of the ideas and methods available to them to understand the complexity and interdependence of the large problems we face. The first phase of research was an exploration of what designing sustainably and responsibly can mean for designers, design educators, and design students. This included an extensive literature review; a student and educator survey; a critical analysis of current Visual Communication BA/BFA Learning Outcomes in the United States; an analysis of the priorities of modern design practices, approaches, and advocacy organizations; and semi-structured interviews with 24 visual communication design students, professors, and professional designers with varying degrees of ecological sustainability experience. Analysis of this data indicated that climate resilient design methodology is not often taught as a part of visual communication curricula for a variety of reasons: Visual communication design is not substantially physical in nature. Climate resilience is considered academically separate from design. Professors often see these ideas as too niche to be part of established curricula, and often worry they need more training to teach them.

The data from phase one was synthesized into three frameworks for making sense of sustainability and climate resilience in design education. An homage to Dieter Rams’ *10 Principles of Good Design*, the *7 Mindsets of Climate Resilient Designers* are written as learning objectives and define multifaceted knowledge and practices necessary to build climate resilience. In addition, the different ways professors currently incorporate concepts of sustainability in their course assignments have been organized into *5 Levels of Sustainability Pedagogy in Design Education*. Finally, the project’s design guidelines are based on qualitative data from professor interviews.

These frameworks informed the development of **The Shift Deck**: a deck of 27 cards that present small steps–or Shifts–educators can take to weave climate resilient strategies into their existing assignments. Each Shift includes a rationale for its climate resilience and a learning objective that states what students should know and be able to do as a result of incorporating the Shift into their work. This bottom up approach allows educators to advocate for climate resilient design practices in the classroom without completely overhauling their pedagogy.

The Shift Deck has been refined through an interactive prototyping process, including a co-design activity with ten visual communication design educators and two in-class workshops with students. With continued refinement and co-design, these shifts have the potential to cultivate a generation of designers whose work is creative, thoughtful, and resilient.

How can I cultivate long-term thinking with future generations so that we inspire resilience?

cultivate: nurture and encourage

long-term: expand our horizon of care beyond our own lifetimes and experiences to those of future generations

thinking with: consideration of the effects of our actions; in partnership and unity

future generations: an uncertain vision; those who will inherit our world and all the systems we have created to make sense of it

we: our collective actions and mindsets

inspire: act as a model for

resilience?: thriving in the face of tumultuous change

CALLING INTENTION

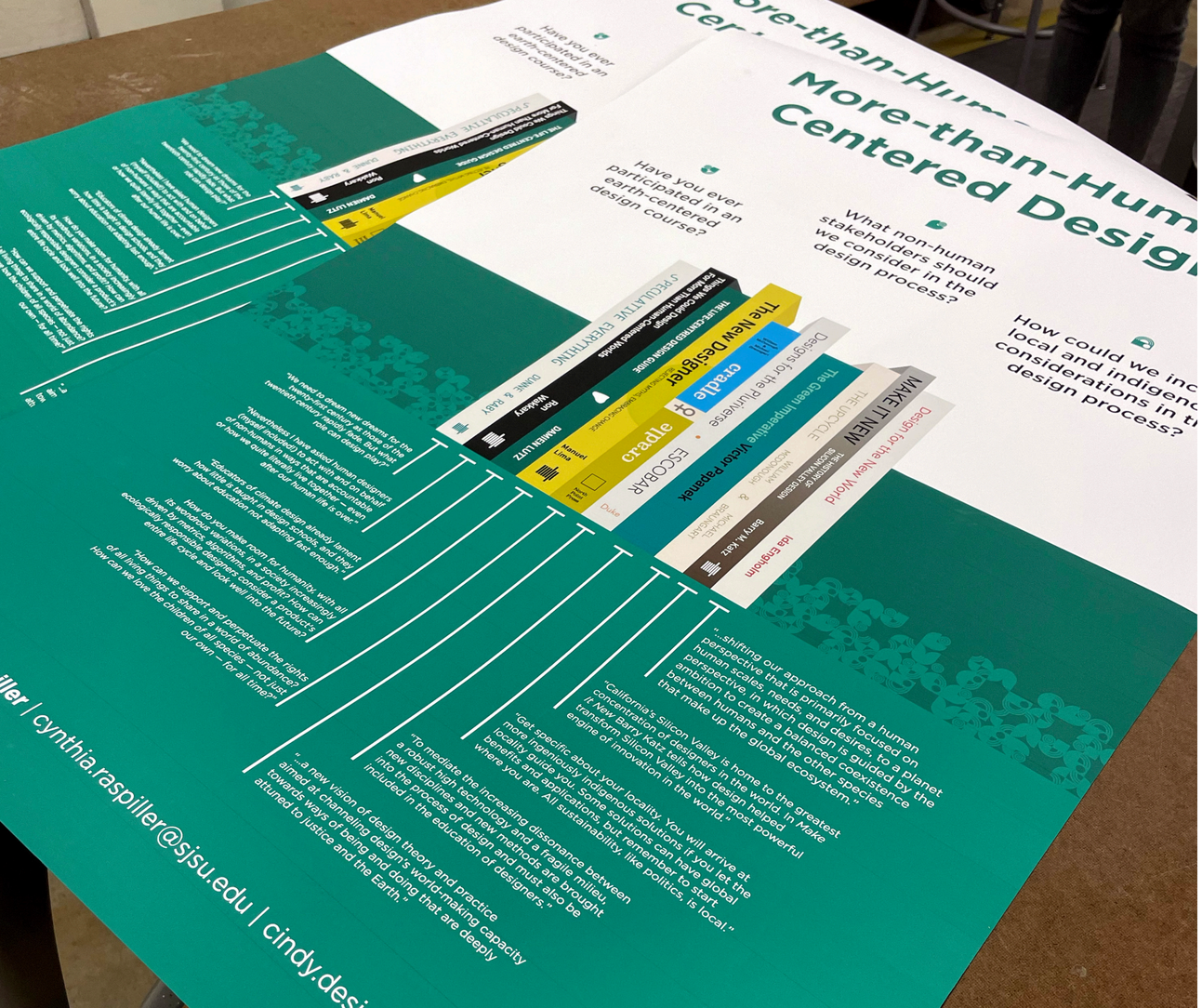
I am a designer. I've run my own web and graphic design studio in the Bay Area for over a decade, working on projects with big tech companies, startups and local businesses. I love what I do, and I've always wanted to become a design educator at some point in my career. **I am also a mother.** I became one right before the pandemic, right before our community was devastated by Covid and wildfires, our air filled with toxic smoke. I began to question climate resilience in my role as a designer, and the future I was leaving to my daughter. In many ways, she is responsible for this work–I am not sure I would be doing this were it not for her.

At a point in my research when I was feeling unsure about the direction I was going in and the importance of the final outcome, I completed a calling intention workshop with senior BA Design Studies students under one of my thesis advisors, Andrea English. The workshop is part of the Sea Change Design Process℠, a proprietary process by Lauralee Alben, founder of the Sea Change Design Institute®.[3] Andrea guided students through activities to find their calling intention–their life's calling, phrased as a question that is "big enough to inspire you for the rest of your life." We began by summoning a defining moment in our lives, processed it holistically, and then drew its embedded wisdom to shape our calling. The wisdom I discovered through this process was to choose to love myself, and all will fall into place. I came to the realization that going back to school was an act of self-love; the first time in a long time that I chose to do something for myself, something that would be challenging and fun and fulfilling. I felt as if I rediscovered some long dormant wants: the fulfillment I get from teaching, my love of design and writing, a desire to build something bigger than myself. This all culminates in my calling intention, a question big enough–profound enough–for me to dedicate my life's work to.

[3] Learn more at https://seachangedesign.com. The Sea Change Design Institute works with "leaders and organizations to co-design positive, profound, and regenerative transformations."

Locating the thesis range

Initial explorations,
paths not taken,
and clarifications.



Left: This poster represents my earliest research efforts, which were mostly literature reviews, in October 2023 at the SJSU/Adobe *Experiential Horizons* event.

Right: Live at *Experiential Horizons* in October 2023.

LOCATING THE THESIS RANGE

Something needs to change

To me, the craft of graphic design feels like care and intention made visible. We pour our hearts and talents into the smallest of details, carefully crafting visuals and messages with just the right tone and balance.

But lately, this care and intention feels a bit phony. My care and intention feel misplaced. As the world literally burns, I design. And yet, we're told that that's there's power in a well-executed message paired with a well-executed visual. But messaging isn't working; we are all aware of the impacts of climate change, of the solutions the world could be implementing, of the increasingly polarized realities we all inhabit. Graphic designers aren't taught methods for climate resilience as a part of their education because it's not seen as a marketable skill. If educators do want to teach climate resilience, the bureaucracy of higher education can make changes to curricula cumbersome at best. The noble ideals of human-centered design have been co-opted to build apps that hold our attention and devices we want to buy. The world burns, and the market churns.

I began my thesis research with this vague sense that something needs to change–perhaps something in design pedagogy. I began to research ways design could be made more sustainable. I looked into design tools, spoke to students, professors, and professionals, and explored AI.

What follows is a picture of the paths I went down as I explored the terrain of sustainable design and how those paths guided me towards the final iteration of my master's thesis project.

Personas for nonhumans

My thesis research began as a search for alternatives to human-centered design. I thought that maybe, if we focused on centering our design around all life, instead of just humans, we could do something Good. I quickly found Life-Centered Design,[4] a framework hailing from Australia that looks at tools and methods for considering all of life in the design process. This led me to academic research on ecosystemas,[5] which are basically personas for ecosystems. I thought the idea of design tools for "more than human-centered design" would be an interesting area to explore.

The problem with making personas for not-people is that personas are based on individuals and their needs in relation to a design problem. Ecosystemas need to be based in scientific, researched, actual fact. No one can ask an ecosystem how it feels about a ride sharing app, but we can factually know that more traffic pollutes the air, and that is factually not good for the local flora and fauna. Building an ecosystema requires that we backup all of this information with research. Bill Tomlinson and his team of researchers recommend building a coalition of scientists, biologists, local government agencies, and indigenous leaders to build a proper ecosystema.[6] This coalition would be available in a sort of co-design process to build and maintain the ecosystema as it is utilized throughout the design research process.

Obviously, this is all a very expensive proposition. Any business wishing to implement ecosystemas in their design process would need to create an entire department to handle research and implementation for what amounts to a very small part of their overall product.

And who would hold all the stakeholders accountable to the ecosystema?

Don Norman but for animals

At this point in my research into nonhuman design tools, I got incredibly focused on defining the term "nonhuman." For the record, nonhumans can be plants, animals, fungi, microbes, climates, and natural planetary systems. I also extended the term "nonhuman" to refer to humans that were not stakeholders in the final design, but were affected by it – whether through forced labor or environmental degradation due to resource extraction or business practices. It's incredibly important to include nonhumans in design processes if our desire is planetary health. Humans, by virtue of being sentient, often consider ourselves "on" this planet, rather than "in" it. We are part of an interrelated planetary system, and when one part of the system suffers, it affects the rest.

Creating design tools for nonhumans and ecosystems, as we've established, is an expensive proposition. It requires expert input, rigorous research, and constant revision–because we cannot ask nonhumans and ecosystems about their preferences, we have to rely on facts and science. I began to look into ways to make this process more efficient. Perhaps if it were easier to create these tools, design teams would be more apt to use them.

Perhaps AI could create these tools for us.

Stochastic parrots

Some reading this are already aware that, for so many reasons, AI cannot create these tools for us. Not right now–maybe not ever. It took me some experimenting to figure this out.

I trained a GPT on Tomlinson's ecosystema research. OpenAI had recently released the ability to create a GPT(Generative Pre-Trained Transformer) to the (paying) public, so I jumped on that bandwagon. In a nutshell, you could ask my chat bot to create an ecosystema for anything, and it would use Tomlinson's research to return a series of images and bullet points to you, detailing the ecosystem's characteristics, "user" story, challenges, and services desired. [7]

This would work great, in theory–if you could guarantee that the GPT would return nothing but factual data, not hallucinate, and if artificial intelligence was not a system built on data filled with the inherent biases and experiences of a humanity-centered existence. Also, the environmental impact of artificial intelligence is enormous,[8] which isn't really a great look for a thesis project focused on sustainability. A professor I showed this early work to gently pointed me in the direction of Emily Bender and her paper, "On the Dangers of Stochastic Parrots: Can Language Models Be Too Big?"[9] It became almost immediately apparent that this is not the solution I was looking for.

[4] Life-Centred Design, based in Sydney Australia, is a project by Damien Lutz that provides methodologies and frameworks for centering design around the needs of all life.

[5] Tomlinson et al., "Ecosystemas: Representing Ecosystem Impacts in Design."

[6] Tomlinson et al., "Ecosystemas: Representing Ecosystem Impacts in Design," 6.

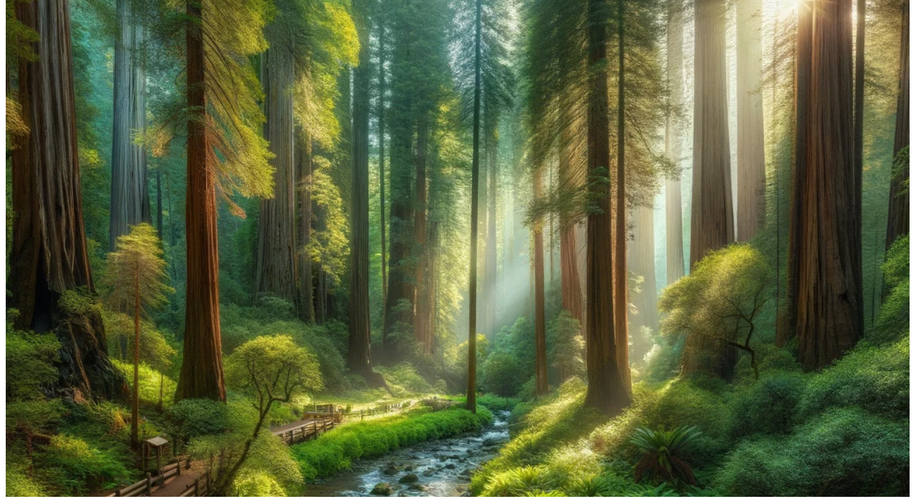
[7] You can try it–but only if you don't care about the environmental footprint of the processing power ChatGPT needs to respond. View at: https://chatgpt.com/g/g-GUUfUY00E-ecosystema-generator

[8] Zewe, "Explained: Generative AI's environmental impact."

From the article: "Scientists have estimated that the power requirements of data centers in North America increased from 2,688 megawatts at the end of 2022 to 5,341 megawatts at the end of 2023, partly driven by the demands of generative AI."

[9] Weil, "You Are Not a Parrot. And a chatbot is not a human. And a linguist named Emily M. Bender is very worried what will happen when we forget this."

For those who have less patience for academic papers.



Right: An AI generated image that represents the ecosystem of California's Big Basin State Park, created by the Ecosystema Generator GPT.

From parrots to pedagogy

I began to pivot back towards academia, researching how sustainability and equity–two concepts necessary for climate resilience–are currently taught at the postsecondary level. I spoke with disillusioned design students, professional designers who carved niches out for themselves by creating a sustainability-focused practice, and professional designers who felt their employers did not care for sustainability unless it could improve their bottom line. I spoke with professors who were immersed in teaching innovative methods of sustainability, professors who felt sustainability was a fad from the early 2000's, and professors who would love to teach more sustainable design, but didn't have space for it in their syllabus. I looked at the learning objectives and learning outcomes of design programs across the United States, and I studied the priorities and principles of modern design movements, methodologies, and organizations. I studied methods for sustainability in other areas of design–industrial design, service design, and UX design. I interned with the city of San José's Carbon Neutral Creative Network[10] and learned climate resilient methodology from the arts and culture sector. I read Bruce Mau, Victor Papanek, Tony Fry, Elizabeth Ayana Johnson, David W. Orr, Don Norman, Brian Dougherty.

What I discovered were innumerable ways to design for climate resilience. The problem isn't that we don't have methods for climate resilient design–the problem is that we aren't learning and implementing them fast enough. The beauty of this research is that small steps–*shifts*–towards climate resilience can be built into any design project. Any visual communication designer can do more than just recycle their paper. They can practice utilizing carbon calculators. They can write more efficient code. They can create nonhuman personas.

These small shifts can add up to big changes. They can empower designers to use their craft for more than just marketing, knowing that the actions they are taking are helping to build a healthier planet. And these shifts can be incorporated at the postsecondary education level. My thesis project helps visual communication educators empower their students to be more than just voices for climate resilience–their work, their practice, everything they create can be a vehicle for actual, incremental change.

The Decks

This is where my project begins. The deck has gone through quite a few iterations in its short lifetime. There was even a deck that preceded the final deck, aptly titled The SEED

[10] PBS NewsHour, "How artists are using their talents to help San Jose reduce its carbon footprint."

The city of San José, California has pledged to go carbon neutral by 2030, and they've created the Climate Art Program to build energy and support through engagement of the city's arts and cultural sectors. PBS Newshour did a spotlight on the program.

Deck.[11] And I would be remiss to mention the IDEO Methods deck, the mother of all design decks. The IDEO deck offers methods for human-centered design research and is a fantastic resource for those embarking on a participatory or co-design project. In fact, the inspiration for the final form of this project came about while I was referencing methods from the IDEO Methods deck for an unrelated project.

Towards the end of my research, The Life-Centred Design Lab, a project by Damien Lutz, released a deck called the "Life-Centred Design Innovation Cards." While my deck offers pedagogical interventions for climate resilience, Lutz's deck offers businesses and designers hypothetical prompts to nudge towards more planet-friendly ways of doing business and design. For those in the realm of product or industrial design, these are definitely worth exploring as well.

Call me trim tab

I consider this project to be my own small piece of transition design:[12] my own attempt at addressing a Wicked Problem so that we may shift design education towards a more sustainable, equitable, and desirable future. My trim tab.

Buckminster Fuller–futurist, inventor, designer–is famous for (among many many other things) using the trim tab as a metaphor.[13] It requires a lot of force to move a huge rudder attached to a huge ship. A trim tab is a small strip of metal that is attached to the rudder; because of its small size, it requires much less force to move a trim tab. Moving the trim tab creates an area of low pressure, which means less force can be used to then move the larger rudder. In this way, making one very small change with little force can help steer the larger boat in a desirable direction. It might not feel like a single designer can make a large difference on her own, but small shifts towards a better future can help move the whole ship.

[11] Explore the SEED Deck and its use on page 28.

[12] Irwin and Carnegie Mellon University, "About Transition Design."

Professor Terry Irwin teaches transition design to grad students at CMU. The course website, listed in the bibliography, is an excellent resource for any who are interested.

[13] Farris, "The Power of 'Trimtabs': What Bucky Fuller Taught Me About Human Greatness."

Right: "People, Places, Things," a digital collage created for my Pre-Proposal research, brings together elements of my thesis topic in a visual essay. Many elements of this preliminary brainstorming carried through to my final thesis proposal.

Phase 1

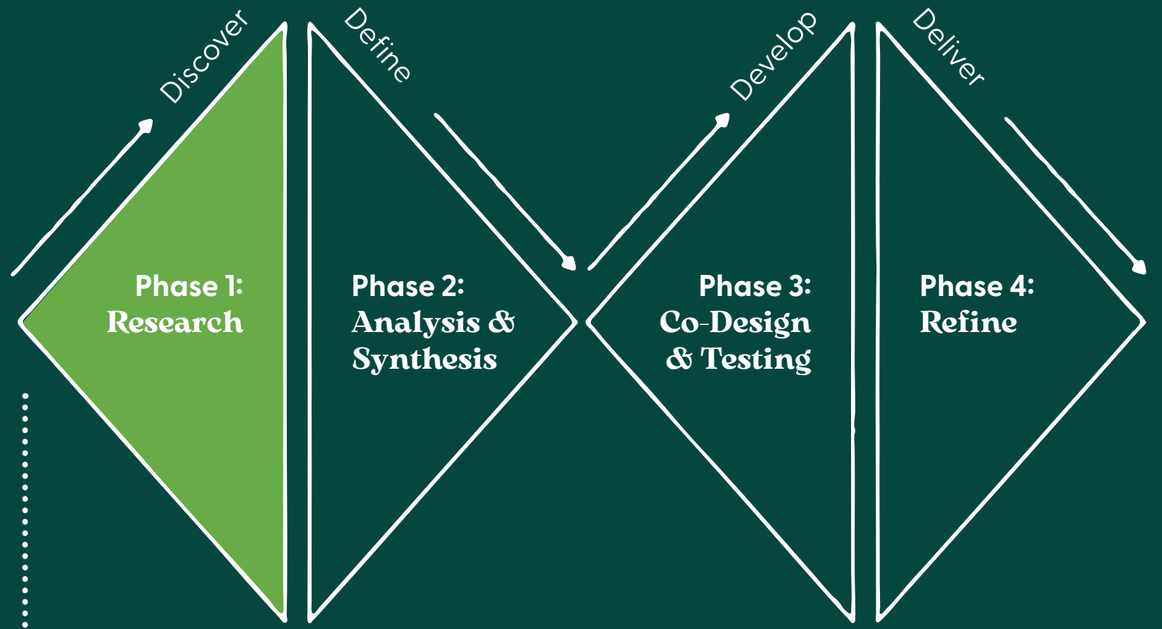
Repository of insight

Literature, surveys and analysis, the SEED Deck, and interviews

PHASE 1: RESEARCH

The first phase of research was an exploration of what designing sustainably and responsibly can mean for designers. This included an extensive literature review; a student and educator survey; a critical analysis of current Visual Communication BA/BFA Learning Outcomes in the United States; an analysis of the priorities of modern design practices, approaches, and advocacy organizations; and semi-structured interviews with 24 visual communication design students, professors, and professional designers with varying degrees of ecological sustainability experience. Analysis of this data indicated that climate resilient design methodology is not often taught as a part of visual communication curricula for a variety of reasons: Visual communication design is not substantially physical in nature. Climate resilience is considered academically separate from design. Professors often see these ideas as too niche to be part of established curricula, and often worry they need more training to teach them.

My literature review helped me get a sense of what we can do so that our work not only carries a message of climate resilience, but is climate resilient. We can't design for something if we're unfamiliar with the language and methods of it. Luckily, so much of this information is already out there. This is only half of what I studied.



Literature Review

Design Education & Global Issues Survey

Learning Outcome Critical Analysis

Priorities of Modern Design Practices, Approaches, and Advocacy Organizations

SEED Deck Conversations

Semi-Structured Interviews

DESIGN EDUCATION & GLOBAL ISSUES SURVEY

To kick off my exploration into sustainable design, I distributed a survey to determine whether designers, design educators, and design students feel that they are equipped with the tools, training, and/or vocabulary to design in such a way that they can approach the large problems facing the planet. These questions were meant to be a general probe into this topic, and they served as a basis for my interview questions.

I received 44 responses over the course of about forty-five days. Roughly 55% of the responses were from design students, and 45% were from professionals and educators.

These were the questions I asked:

Are you a working designer, or are you currently studying/ training in design?

What do you perceive as the most significant challenges currently confronting the planet?
AI / Biodiversity Loss / Climate Change / Inequality / Plastic waste / Pollution / Poverty / War / [other]

How influential do you think design can be in confronting these challenges?
Likert, 1 - 5

How important do you think it is for design to be able to confront these challenges?
Likert, 1 - 5

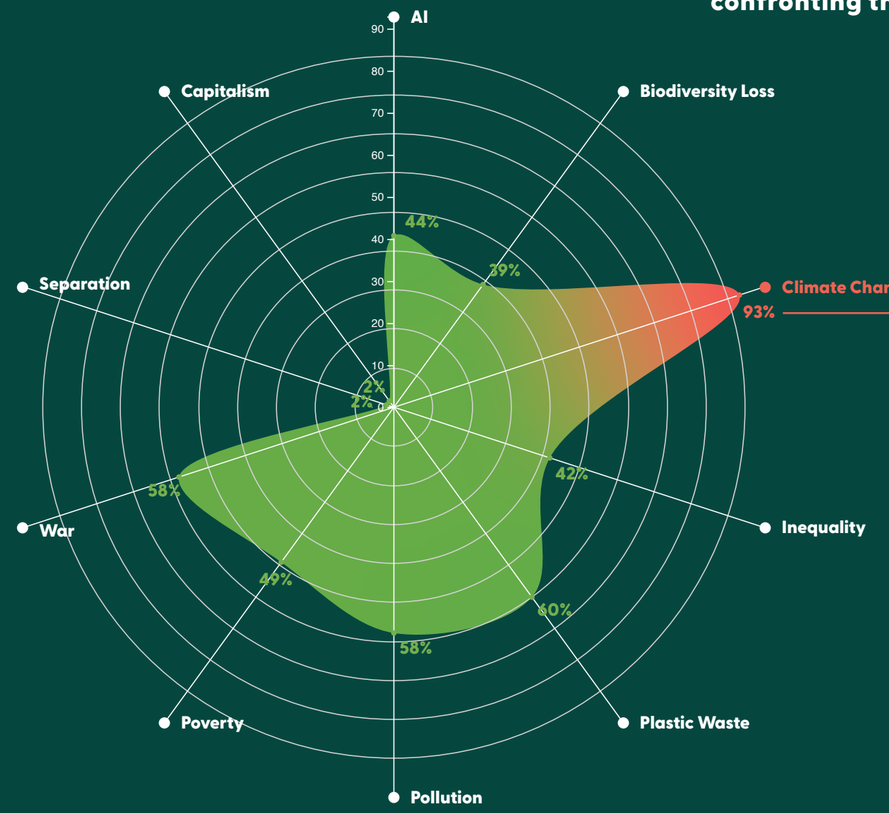
How important is it for you to address these challenges in your own work?
Likert, 1 - 5

In your educational experience, were you given tools to help confront these types of challenges?
Yes / no

Do you think students should learn how to confront these types of challenges in their design education?
Yes / no

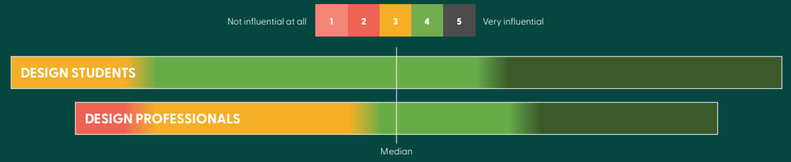
Have you found any resources on your own to help confront these types of challenges?
If so, please share:

What do you perceive as the most significant challenge currently confronting the planet?



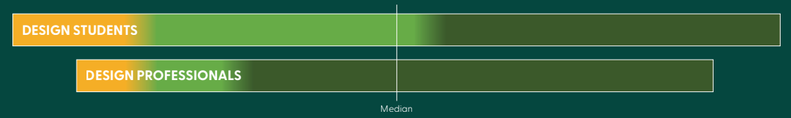
Results

A whopping 93% of survey respondents listed Climate Change as one of the most significant challenges facing the planet.



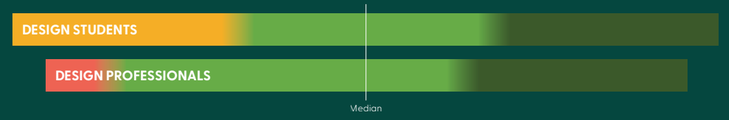
How influential do you think design can be in confronting these challenges?

Most design students think design has the potential to be very influential in confronting the most significant challenges facing the planet. Design professionals seem a little more jaded, but are still optimistic.



How important do you think it is for design to be able to confront these challenges?

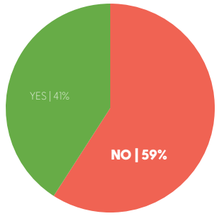
Students and professionals alike agree that it is important for design to be able to confront the most significant challenges facing the planet. The vast majority of answers to this question were a "5" on the likert scale.



How important is it for you to address these challenges in your own work?

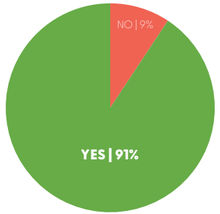
If I were to dig deeper into this question, I would want to know if designers would *like* to be able to address these challenges in their own work – does their job limit the influence they feel design can have on these challenges?

In your educational experience, were you given tools to help confront these types of challenges?



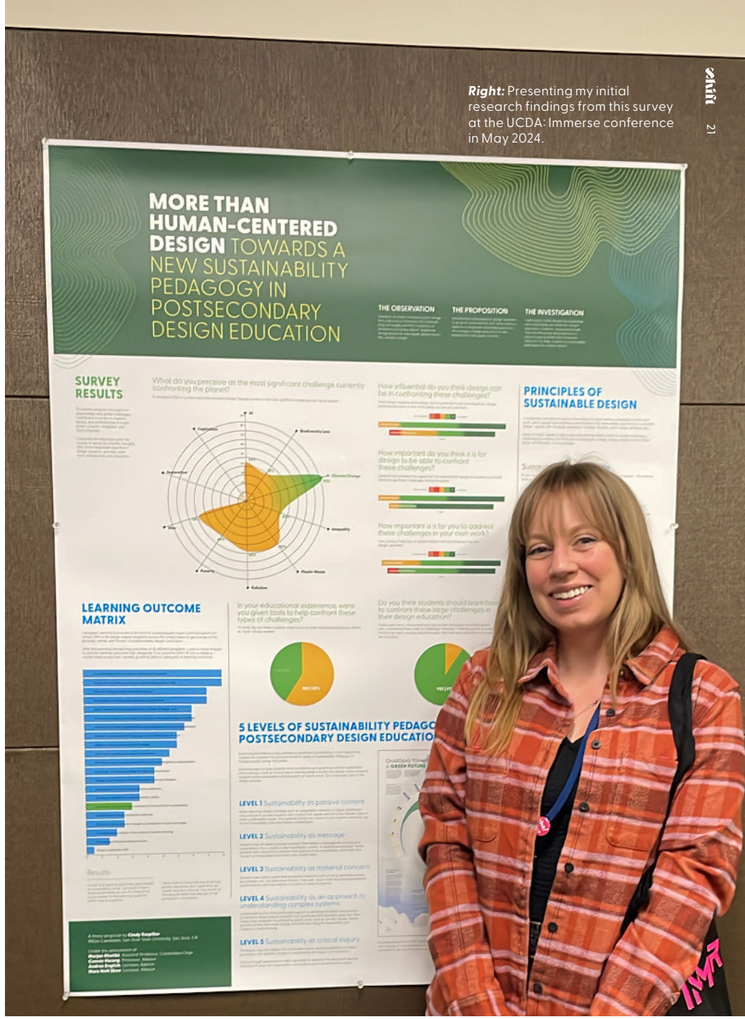
To really dig into these numbers, more focus on what students/professionals define as "tools" will be needed.

Do you think students should learn how to confront these types of challenges in their design education?



There were many I interviewed who did not feel that design should be tasked with confronting these kinds of challenges. However, I think this points to a deeper finding that many working designers resent that their work does little more than help sell a product.

Right: Presenting my initial research findings from this survey at the UCDA: Immerse conference in May 2024.



LEARNING OUTCOME CRITICAL ANALYSIS

I analyzed Learning Outcomes (LOs) from undergraduate Visual Communication (or similar) BFA or BA design degree programs across the United States to get a sense of the priorities, trends, and futures of postsecondary design curriculum.

My research questions included:

- How are learning outcomes crafted?
- What are the priorities of learning outcomes for Visual Communication BFA and BA programs across the United States?
- How many of these outcomes are related to issues of sustainability?
- What are trends in design program learning outcomes? Which programs are looking towards the future?

Student learning goals are often stated as learning objectives or learning outcomes. While I initially assumed the terms were interchangeable, I discovered that there are important nuances between the two. In her book Teaching Design, Meredith Davis defines learning outcomes as, "what students should know and be able to do as a result of their education." Learning outcomes are more specific than objectives, and are written to include the knowledge, skills, and disposition expected of students, the ways students will demonstrate these competencies, and criteria for evaluating student success. Davis defines learning objectives as, "the student competencies necessary for goal achievement, describing what faculty expect students to know, value, and be able to do." Learning outcomes can be written at the level of projects, courses, and curricula, and universities will often make them public-facing. Learning objectives tend to be broader; educators will often use objectives as the benchmark for student success.[14]

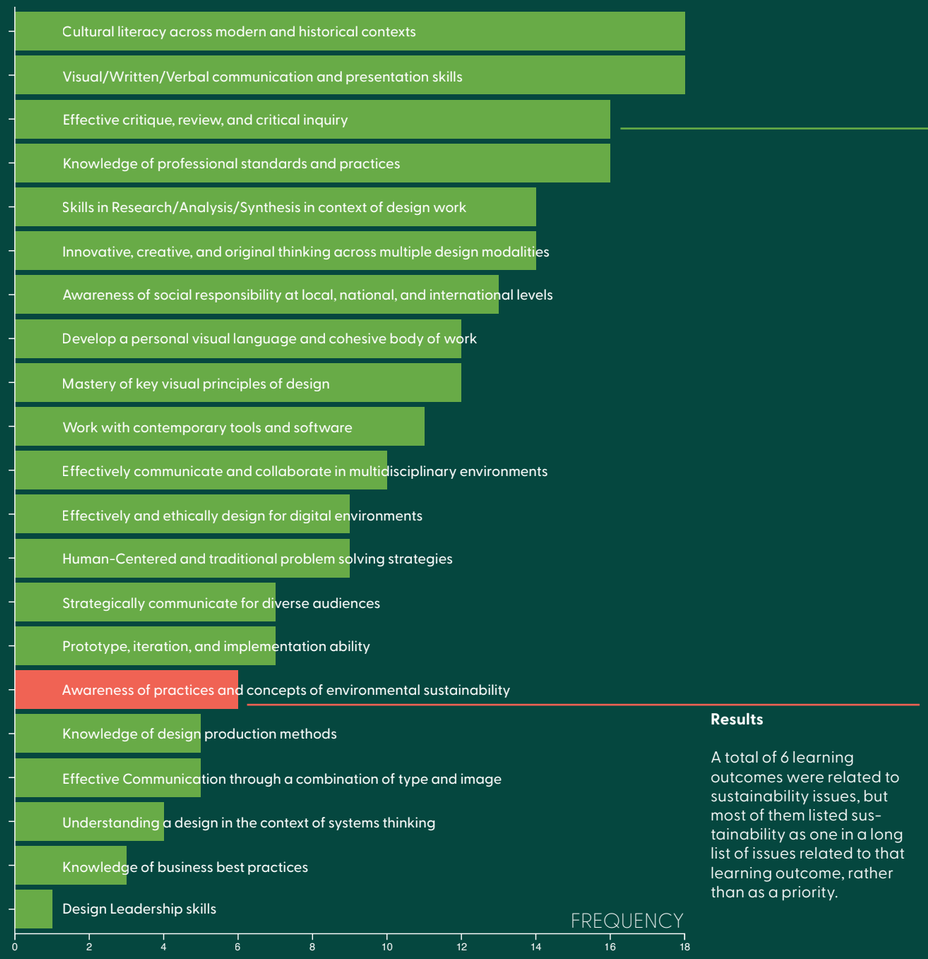
Researching learning outcomes gives me a broad idea of what universities and colleges want their students to be able to do with their skills once they graduate.

After documenting the publicly available learning outcomes of 31 different programs, I thematically sorted the learning outcomes into categories using a critical analysis of the outcome's wording and intent. This is necessary because there is no formula for writing learning outcomes that is consistent across all institutions. Some universities may have nine outcomes for a BFA design program, while others may have three. If an outcome didn't fit into a category, I would create a new one. I ended up with 21 distinct themes among the learning outcomes.

Once sorted, I found the priority of a majority of design curricula by noting the themes with the largest number of applicable learning outcomes. This data will be useful in helping to make the case for my thesis, and it will also be useful as a reference for creating my own learning outcomes for sustainability and equity.

A total of 6 design programs had learning outcomes that mentioned sustainability, however it was usually part of an itemized list of issues related to cultural, equitable, and ecological concerns.

[14] Davis, *Teaching Design*, 68.



I don't wish to imply that any of the top priority outcomes don't deserve to be where they are in this list. Visual communication designers are in possession of a diverse skill set.

Results

A total of 6 learning outcomes were related to sustainability issues, but most of them listed sustainability as one in a long list of issues related to that learning outcome, rather than as a priority.

The Sustainable Learning Outcomes

The following Visual Communication (or similar) BA and BFA programs mentioned environmental sustainability in their learning outcomes:

Learning outcomes with concepts of sustainability at their core

California College of the Arts
BFA Graphic Design
"Students demonstrate an understanding of sustainability as a global, social, economic, environmental, and practice-based concern."

Ohio State University
BS Visual Communications Design
"Students will develop an understanding of and appreciation for the role of the designer in environmental relationships."

Learning outcomes with sustainability as part of a larger whole

University of Illinois Urbana-Champaign
BFA Graphic Design
"Develop a critical and reflective orientation toward the diverse professional, social, environmental, and ethical implications of the graphic design discipline in order to respond to societal challenges."

North Carlina State University
BA Graphic & Experience Design
"Students consider long-term consequences of usefulness, usability, desirability, technological feasibility, economic viability, and sustainability."

Arizona State University
BS Graphic Design
"Address creative environments that respond to ecological concerns, sensitive to cultural aesthetics, sustainability, and social issues through skills for reading, analyzing, and discussing interactions between designers and society."

San José State University
BA Design Studies
"Engage in global views and weigh design decisions within the parameters of ecological, socio-economic, and cultural contexts."

Methods for Finding Published Learning Outcomes

Many colleges list their Learning Outcomes online, but many do not. I chose to only use the Learning Outcomes that were available publicly, though I was ale to obtain some that are not publicly available. While nice to have, they did not provide any measurable difference in my final results.

I tried my best to find data that was up-to-date, however it's unclear how often some of the outcomes are updated, and whether those updates make it to their program websites in a timely fashion.

Program Learning Outcomes Analyzed

This is a complete list of the program learning outcomes I analyzed. My goal in compiling this list was to get a good spread of universities from many different locations in the United States.

California College of the Arts / BFA Graphic Design

Ohio State University / BS Visual Communications Design

Arizona State University / BS Graphic Design

University of Illinois Urbana-Champaign / BFA Graphic Design

North Carlina State University / BA Graphic & Experience Design

San Jose State University / BA Design Studies / BFA Graphic Design

University of Florida / BFA Graphic Design

Minneapolis College of Art & Design / BFA Graphic Design

University of California Los Angeles / BA Design | Media Arts

University of Utah / BA Multidisciplinary Design

Stanford University / BS Design

Fashion Institute of Technology / BFA Graphic Design

Boston University / BFA Graphic Design

Rhode Island School of Design / BFA Graphic Design

Savannah College of Art and Design / Core Foundational Studies

University of Wisconsin Whitewater / BFA Graphic Design

John Brown University / BS Graphic Design

Maine College of Art and Design / BFA Graphic Design

Carnegie Mellon University / BDes Communications

Parson's New School / BFA Communication Design

Iowa State University / BFA Graphic Design

Purdue University Fort Wayne / BFA Visual Communication Design

University of California Davis / BA Design

University of Delaware / BFA Visual Communications

Champlain College / BFA Graphic Design & Visual Communications

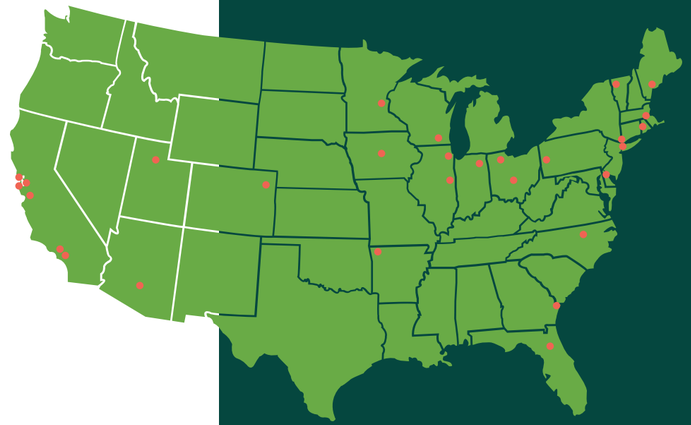
San Francisco State University / BS Visual Communications Design

Bowling Green State University / BS Visual Communications Technology

Loyola University Chicago / BFA Visual Communication

UNIVERSITY MAP

I collected publicly available learning outcomes from design programs at colleges and universities across the country. I tried to samples a broad range of schools - public and private, small and large, art schools and liberal arts colleges.



PRIORITIES OF MODERN DESIGN PRACTICES, APPROACHES, AND ADVOCACY ORGANIZATIONS

Throughout the course of my research, I came across numerous design practices, approaches, and advocacy organizations that focused on sustainability. In an effort to make more sense out of these various approaches, I analyzed the stated public priorities of them.

I completed a thematic data analysis of the priorities, values, or mindsets of a few contemporary design movements, methods, and organizations advocating for sustainable practices. I summed the priority up in a word or two, then I created an alluvial diagram to visualize where the various priorities overlap, and what the outliers are.

The top four priorities are, in no specific order:

Systems Thinking
The ability to conceptualize a design project within the context of the many complex systems it exists in and/or contributes to, and to consider how small changes to that system can create larger change.

Future Thinking
The ability to conceive of a more desirable future, for us and our ancestors, and to visualize a path towards it.

Sustainability
Designing in a way that sustains planetary systems while being equitable to humanity.

Iteration
Solving large problems means designers will have to hone iteration and prototyping skills, while being comfortable with the idea that we might not get it right the first time.

Modern Design Practices, Approaches, and Advocacy Organizations that were analyzed:

Biomimicry: The design and production of materials, structures, and systems that are modeled on biological entities and processes for the purpose of designing regenerative solutions.[15] Biomimicry was popularized by Janine Benyus in her 1997 book, *Biomimicry: Innovation Inspired by Nature.*

Circular Design: Designing systems and products that minimize waste and maximize resource efficiency by prioritizing reuse, recycling, and regeneration. Circular Design supports a circular economy, which is an industrial system that creates zero waste by optimizing production for reuse and regeneration. The Ellen MacArthur Foundation has created a guide to circular design called The Circular Design Guide,[16] an online repository of inspiration, resources, and methodologies.

Climate Designers:[17] A global community that empowers designers to be climate leaders by using their skill sets to learn about, connect, and act on climate solutions. They've published a Field Guide to Climate Design, and research Climate Design curriculum through their New Wave Project.

Disruptive Design: Developed by Dr. Leyla Acaroglu, The Disruptive Design approach[18] utilizes a multidisciplinary approach to design for positive social change through sustainable practices and regenerative systems design.

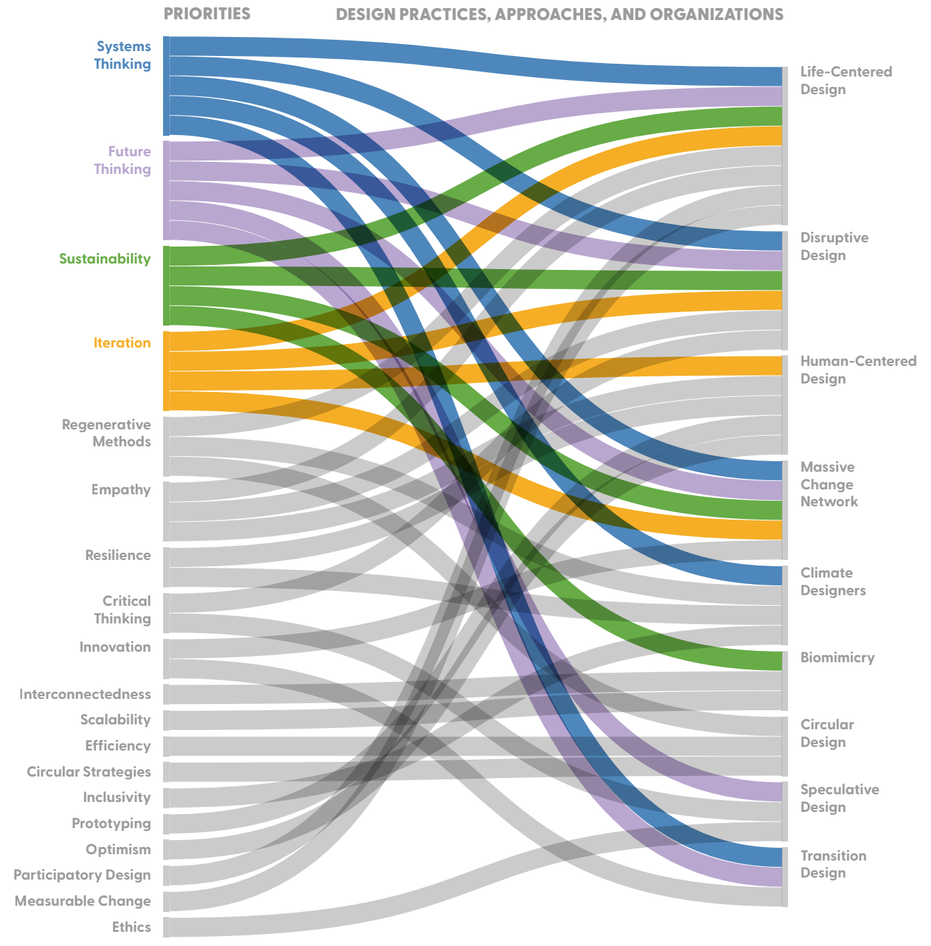
Human-Centered Design:[19] HCD is an iterative approach to problem-solving through design that prioritizes understanding and addressing the needs, desires, and behaviors of end users.

Life-Centered Design: Imagined by designer Damien Lutz,[20] Life-Centered design focuses on frameworks and methodologies to understand and optimize complex natural systems, focusing on the interactions and relationships between components.

Massive Change Network: The Massive Change Network[21] uses Bruce Mau's 24 Principles for Designing Massive Change to work with companies that wish to implement sustainable, meaningful change that benefits all economical, ecological, and social systems.

Speculative Design: A design practice that explores possible futures by proposing scenarios, artifacts, or narratives that challenge existing norms and assumptions. Anthony Dunne and Fiona Raby wrote *Speculative Everything*,[22] a tour of the process and outcomes of using design to explore potential futures.

Transition Design: An interdisciplinary approach focused on addressing some of the most complex challenges we face by envisioning and facilitating pathways toward more sustainable and resilient futures. Terry Irwin, director of the Transition Design Institute at CMU and co-originator of Transition Design, maintains a website for the Transition Design Seminar at transitiondesignseminarcmu.net.[23]



[15] Benyus, BIOMIMICRY: A Visual Guide.

[16] Ellen MacArthur Foundation. "Introduction to circular design."

[17] Climate Designers. "We believe in values that shape our work and the world."

[18] Acaroglu, "A Quick Guide to the Disruptive Design Method."

[19] IDEO.org. *The Field Guide to Human-Centered Design.*

[20] Lutz, *The Life-Centred Design Guide.*

[21] Mau, *MC24: Bruce Mau's 24 principles for designing Massive Change in your life and work.*

[22] Neely, *"What is Speculative Design?"*

[23] *Irwin, "About Transition Design."*

Right, and following pages:
Select cards from the final SEED Deck depict questions about sustainability, equity, design, and education superimposed over photographs meant to provoke discussing and evoke meaning.

THE SEED DECK: SUSTAINABILITY AND EQUITY IN EXPERIENCE DESIGN

Creating a methods deck was an assignment in our graduate-level writing course, taught by one of my thesis advisors, Mara Holt Skov. At this point in my research, I was struggling with how to focus my attention and what kinds of questions to ask my interviewees. I created 100 questions related to my thesis research, and from there narrowed my line of questioning down to 20 questions, for a deck of 20 cards meant to stimulate conversation. I chose a stock photo to accompany each question, but felt as though the photo may influence the answer to the question. I decided to pair each question with two images, one of the front of the card, and one on the back. The images serve as a visual stimulus and starting point for conversation. Each image in a pair represents a different aspect or viewpoint of the question being asked, with the goal being to get the interviewee to approach the question from different viewpoints, or to expose them to an aspect of sustainability they hadn't thought of before.

I used this deck to guide short discussions around sustainability and equity in design. The questions are designed for educators, students, and professional designers to answer together, but could also work without the aspect of trans-disciplinarity. Groups of three to five participants draw three cards from the deck and place them on the table. The cards ask questions about sustainability, equity, design, and education. After a few minutes, participants flip the cards over and discuss the same questions, but now with different visual prompts. Participants may find that the different images provoke different feelings, emotions, and associations.

When observing and facilitating these conversations, it's important to notice the interaction between participants. How do participants respond to the paired images? Do students ask for clarification regarding questions on pedagogy? Do professional designer's answers differ from student's? The idea is that the conversational interplay between the participants is just as valuable as their answers to and conversations around the prompts.

While this deck did not become my final thesis project, it greatly influenced the trajectory of my research and the way I framed the questions I was asking my interview participants. It gave structure to my thoughts and an orientation to my research. It planted the seed for what would eventually become the Shift deck.

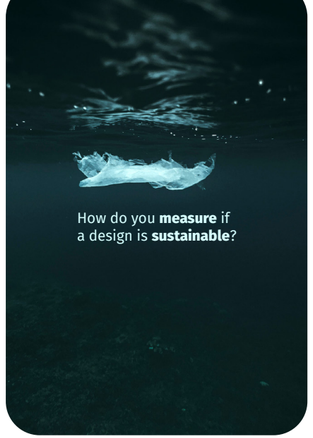
Analysis & Synthesis

I've included some quotes from SEED Deck conversation test runs I held with students in a lower-level digital design course at San José State University. I spoke with groups of five to six students for roughly ten minutes at a time. We drew a few cards at random and placed them on a table, and then I attempted to facilitate a conversation around the questions on the cards.

"When I think of climate change, I feel a sense of urgency, because it's not getting better. I hear more about it through the news, like on social media, about climate change and everything that's happening around it. My classes are not bringing it up."

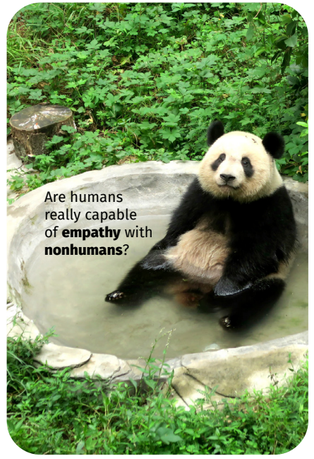
"What I think about climate change, now that I've learned about stuff from the ocean, it feels like you can't really do anything about it. Because society has been evolving and evolving and we're not really going back to like, using less stuff any time soon."

"For cultural values like I'd say maybe something like Buddhism, which is against the harming of like, you know, nature. And I mean, in broad strokes, it is, but you could extrapolate that and form that into your own opinion about sustainability."



"I find it kind of funny how, as humans, we're designed to be adaptive. But then, we like certain things to not change at all. And that may vary for each person, but then with other things–we get like, really frustrated when they're not changing all the time."

"My family is from Syria. We have very scarce resources. And we try our best to actually just, you know, like save and fix things that are broken or reuse things, but not to the level that it's gross, you know what I'm saying? But, yeah, I do feel like my cultural values influence my sustainable choices."



"I think 'measuring sustainability' is a very interesting one because I think there's so many ways you can measure it. You can measure the awareness of our sustainability, you can measure like, what actions you can take. So I think it's a broad subject, but I feel like as long as you spread awareness to people, they are thinking and talking about sustainability, that's a good base for design."

EXPLORATORY INTERVIEWS

To get a sense of the current state of sustainability in visual communication design education, I completed ten semi-structured interviews with professors from colleges and universities across the United States. These interviews all lasted about an hour, and were incredibly insightful. Roughly half of those interviewed had some interest or practice in climate resilient pedagogy. I also spoke to nine undergraduate visual communication or graphic design students, in structured interviews that ranged anywhere from twenty to forty-five minutes. Most students did not feel they had a lot to contribute to the topic, but there were quite a few who were happy to talk about their experiences and concerns or pick my brain. I also completed five semi-structured interviews with professional designers for roughly an hour each, most of whom were not directly working in a climate-related industry.

What follows are edited transcripts of three interviews, one with a professor, one with a professional practicing designer, and one with a design student. This will provide an idea of the questions asked and variation of responses among participants.

Throughout the rest of this book, I will use quotes from all twenty four interviews to support my research findings. These quotes will be numbered according to interview, and kept anonymous.

Professor Julie Mader-Meersman

Professor of Visual Communication Design, Northern Kentucky State University

This interview edited for length and clarity.

Cindy: Thank you so much for chatting with me today. Can you tell me about your teaching experience, and if you currently teach sustainability?

Julie: I currently teach across sophomore through senior levels in the design program and we will weave in sustainability-centered ideas wherever we can. We have a class called Techniques in Visual Communication Design, which in other programs might be a production class. But here, we frame it as techniques, and we center the class around imaging, prototyping and production methods as they relate to actualizing ideas. Most of what students do in an undergrad curriculum is create hypotheticals, right? The things they make are mock-ups, and they're visions of things and ideas. In this class we talk about, "Okay, what happens when somebody says, 'Yes, you've sold me. I love it, let's go.'" And how do we produce something? How do we do that responsibly while considering human, natural and technical resources? So we try to teach the idea of just, general responsibility. Typically when people say sustainability, they're thinking about the environment. But I encourage them to think about humanity, about any resource allocations or interaction or deployment or employment. How are we as efficient and economic as possible? And that doesn't mean cheap, it just means lean, maximizing effort relative to resources. So, this refers to things like machinery, the people in the workflow, and then, of course, the environmental resources. So that is a framing perspective through which we teach that entire course, which bleeds out into the rest of our curriculum, because it's a value system that we're teaching from, not just some techniques.

In that class, I pull in things from the old *AIGA Living Principles*[24] value system, which doesn't seem to be active anywhere, but I still share it, because the values are meaningful and relevant and important. There's another group called *Design Can Change*.[25] That one was from a similar point in time, approximately 2010 through 2012-ish, when it seemed to be prominent. I would try to tap into anywhere where it's an active discussion point in industry, so that my students could take it seriously. I think younger generations take it extremely seriously; it's a default mindset for them. They've been educated, you know, K through 12, thinking about environmental consciousness, and they see what's happening, and they hear the news more than other generations because of their access to news through social media. We try to teach industry perspectives of it very directly in this class.

What are those industry perspectives on sustainability? How do you weave them into your class projects?

In our Techniques class, we have a sequence of projects that run through identity-based projects that have to have all the different color gamuts, and we talk about differences in how things are made. And then we roll into a project that helps them understand print production specifications. We use a magazine design project there so that they can see how that industry articulates the specs that you have to follow. So that's a way for me to teach them how to read specs. On the third project, we center the learning around package design, and the expectation is specifically a sustainably-minded package design for something using any variety of techniques we have already learned, and special techniques that might be able to give design distinction with die cuts or other things that aren't consuming or adding in more materials. We essentially pose the question: How can we be creative with the use of lean materials? So that project will teach them about FSC certification (the Forest Stewardship Council). And I teach them about the difference between bleached paper and unbleached paper, and recycled paper and volumes of post-consumer waste. So they're very directly learning, from a spec side, what things they should care to design with based on what these things actually mean. And then we shift into digital design prototyping. We do some app-based work, and they're thinking about workflows. So it's really about that actualization idea regardless of the media. There's a lot of probing to do on the print side because of the material consumption.

What I realize I don't do, even with the digital, is talk about the footprint of digital design on an environmental level. I don't really have stats or information or reports to point to about that. I think just the general idea that dark mode saves power in small ways cumulatively is about as far as we get at that. I'm not privy to resources to share with them on that topic. So it doesn't come up. But that class then becomes the value system to take forward into other courses and into practice.

Wow, that's really great. So when you talk about that value system, one of the things I've been asking is, what level of sustainable or ecological literacy do you think design students need to take into their career?

So when you'd say the word "level," I'm not sure what kind of bracketing system you're using to think about that; but the framing that we provide comes through the materials in the class, like slideshows and the briefs that articulate the things to focus on, which are always centered around, "maximum message, minimum means." So whatever project it is, that phrasing leads. That phrasing was introduced to me by one of my design professors at the University of Washington, Judy Anderson. At that time (the 90's), there was a design conference based in Denver called Maximum Message Minimum Means.[26] And that just permanently stuck with me. It's led to a really nice bite-sized way of summarizing the values of thinking about human, natural, and technical resources. I share that when we're designing, we tend to think of the art on a thing, but you have to be conscious that you could either be designing waste, or you could be designing something that is destined for a longer shelf life. So we talk a lot about that. I introduce the book, *How to Wrap Five Eggs*[27] to them. It's from the 60's. It's basically a photo compilation of a lot of woven or otherwise handcrafted container types for goods in Japan. This idea of gift giving, caring for the container as much as the contents, is a non-Western way to think about consumption because, you know, we design so many things that go straight into the garbage when it's in the packaging design realm. So I get them to think: Okay, can you design things with a longer shelf-life or alternative materials? I expose them to these kinds of things just to try to align with a mindset of longevity, and care, and what we choose to use in what we design. So I don't know if I can directly answer your question because I'm not thinking of it in terms of levels. We just express it as a fundamental responsibility to consider all of that. And I tell them in the beginning of the class, we have a show and tell – "bring me something from your home that is designed and printed in a cool way. How do they do that?" We start with that, and a lot of times they're bringing in stuff that's chock full of foil stamps and things like that. We talk about how that's not recyclable because they can't further break that down, and we look at packages that break the recycling chain, like mixed material packages, pasta boxes with a cellophane window... So, unless you're taking that

[24] Werbach, "Designer's Roadmap."

As far as I can tell, this is one of the best descriptions of The Living Principles still available online.

[25] designcanchange.org is no longer active, but its homepage is archived as a web pick on Communication Arts at https://www.commarts.com/webpicks/design-can-change. The homepage reads, "Design Can Change is simple. It works on the belief that our industry can make positive change by working together. Use this resource as a starting point to help bring our community together to encourage sustainable practices."

[26] AIGA held an exhibition in 1994 titled, "Maximum Message / Minimum Means"

[27] Hertzog, *How to Wrap Five Eggs: Traditional Japanese Packaging.*

apart, it can't be recycled. And we talk about how to design with imagery instead of mixed materials. And we talk about how to design without adhesives and all the strategies you can try to use to minimize the material consumption. So we do say, we're conscious that we're using resources, it just really puts that clarity squarely in place there, and hopefully creates a burden of responsibility.

I love that. I think a lot of students – and professionals – don't realize that you can, as you said, break that recycling chain with decoration. I think you've actually answered all of my prepared questions. The one I usually wrap up with is, what does it mean to you to design sustainably?

I would say to design sustainably is having total responsibility for the materials. To try to design responsibly is to be an advocate for—or a sort of protector of— the responsible use of materials. For example, a client might have a packaging idea and they're saying, "well, we're using these Styrofoam things and we need a sticker." You might say, "Hey, can we try a decomposing-friendly material and then a deboss on it?" or something like that. Advocating for ideas that help to expand the potential for sustainable solutions to become normalized. I think that that's important to do. Designers can tend to just give the client what they asked for, and I think designers have to be more vocal about introducing alternatives. We have a responsibility to do that. So, to design sustainably is to be an informed resource for the people that we serve. Thinking about it that way is a nice way to not feel like, "Oh great, my options are limited," which is a really negative way to think about it. I have tried to have students realize that the more they know about how things are produced, the more creatively they can design. They can have a novel outcome because of familiarity with production processes, and knowing how to maneuver them, and how to specify. A lot of designers look down on production and expect others to just make their magic fly, and there's no real room for that in a responsible process. People who empower themselves by learning about this will be better off creatively and their clients will have more unique outcomes.

Thank you. And this is for that one specific class, which is Techniques in Visual Communication Design. When you write your learning outcomes for individual courses, do they align with outcomes for the entire program?

Yes, but first, program learning outcomes as we know them now are a more recent assessment phenomenon relative to the length of time I've been teaching. Assessment methodology and terminology that this question introduces has gotten woven, over time, into accreditation and the dashboard culture of measuring everything quantitatively and qualitatively through required self-reporting. It's absolutely a responsibility to evaluate the effectiveness of what and how we teach, but we were already doing it routinely from a desire to perfect our courses, our curriculum, and our students' experiences. Some assessment language and systems came after I started teaching. Student learning outcomes were first (which are class-specific) and program learning outcomes (the language of which came later, integrated into higher-ed after a "ripple-up" from K–12 educational systems), can make it seem like program outcomes were the starting point. Historically, what we were thinking about first is: What do our students need to be prepared contributors in a professional and global setting? We ask that question first. So this leads to broad goals, like those required at the program level, but it wasn't originally mapped out in those terms. Program and class-specific goals tie in by thinking strategically and tactically, and there is organic back-and-forth between thinking about class- and program-specific goals, which need to evolve or change in different aspects of the curriculum over time.

I started out looking at design courses that are focused on sustainability, and tried to do an assessment of them. And it's, I mean, it's a rabbit hole. There are electives and non electives and they're taught at different levels, and in some cases you're given a ton of information about one course and in other cases you get one sentence. And so I was like, what can I look at that will help me better assess the state of sustainability right now in curricula? And then I discovered learning outcomes. It's such a varied landscape.

Yeah. Well, this is why the mandates start to exist because there are people using tools like syllabi schedules, syllabi policies, and syllabi as contractual tools. That gives everybody transparency about expectations. And then there are some who use them loosely. I guess we're not one of those. We're very explicit and transparent and detailed, because it just minimizes confusion and helps students to use the tools of the class as a resource instead of as a mystery. So that's just how we operate in our design department here. The SLOs[28] are nice because, what it gives us a chance to do is–If someone else picks up the class and has to teach it, as long as they're meeting the SLOs, they can teach it however they want. Versus, "here's the package of how you teach the class this one way." And student learning outcomes do provide more possibilities on ways to teach things. They let you adapt with changing technology... If you write them in the right way, you're not trapped in them.

Yeah.

Some people abandoned them because they wrote them too specifically to a period in time that doesn't transfer past that trendiness or a limited scope of tools, or something like that. So we definitely are principle-oriented in how we write our SLOs.

Some schools will have 15 learning outcomes and others will have, like three. I can see how having too many could translate to too many constraints. That's interesting, thank you.

Yes, yeah. I'm curious–one other thing I would share outside of the scope of your questions is that I'm a huge advocate for students growing their own design libraries. I'm bringing books in class and exposing them to resources. I find that, on this topic of sustainability, it's really hard to maintain consistent access to resources. There's one book I found that on this topic in particular–let me snag it...

I love book recommendations.

This one here.[29] It's not a textbook, but I've introduced it as a resource and I used to require it because I think it has a really great introduction about sustainability and design. Let me see the publication date, it's from 2009. Okay, so it's older. Its values align with the way we teach sustainable printing, and then it's basically a kind of showcase of people being creative within the scope of that value system. It starts to introduce a few new techniques, like alternatives to using a bunch of foils and things like that. It's not strictly techniques, it's a lot of exposure to materials and creative ways people are using them, so that's been helpful. But it's now out of print. And there aren't any good current replacements. And then other ones that I have found that suggest that they will be good sources are actually corrupt; for example, in the design of the book they don't even use the principles that they talk about. I just feel so disappointed in this, and the AIGA seems to have dropped the ball on The Living Principles, I don't know why, I don't know the history of that. But, it's just a shame the website isn't up anymore. But I have a giant bibliography for students, if they can get their hands on stuff. I'm at a frustration stage with book resources because publishers are not reproducing second editions of books that are useful, and then there aren't new things taking their place.

Thank you. Yeah, there's so much theory out there, but not a lot written, recently, on practice. I really appreciate your time.

Caden, Student

BFA Graphic Design, Junior

This interview edited for length and clarity.

Cindy: So tell me about your path to get here. What made you want to study design?

Caden: In middle school my parents made me take this one computer class because they wanted to teach me how to type because they were like, "oh it's super cool." It honestly did kind of help me, but we also did some of the design-y stuff. They had us make little animations and stuff like that. So I just continued on that road map or that career pathway for electives. I did more computer based art, and then in 8th grade I also did yearbook. And that was really fun, too, because of layout and stuff like that. So when I got to high school I was like, "I guess I'll commit to this" because they all want us to figure out what we want to do for our careers in high school. I enjoyed my graphics classes there and that led me here.

What does it mean to you to design sustainably?

Well, right now our whole semester is about sustainability. I've just been thinking about the different kinds. Obviously there's environmental sustainability but there's also social sustainability and stuff like that. I guess when I think of sustainable design I usually think of form that's very purposeful. So, obviously it's visually interesting but the form does something, like architecture maybe, and how buildings are designed to maybe let in a little more sunlight and retain the heat so that you don't have to use as much energy on heating or lights, kind of like what we have in the library. And then, social sustainability as well is just making sure things are accessible because our population, our demographics are going to change. Being able to design something that includes everyone will make sure that your

[28] Student Learning Outcomes

[29] The book highlighted is *Print and Production Finishes for Sustainable Design* by Edward Denison. I was able to grab a used library copy from BetterWorldBooks.

design sticks around for the long run and it doesn't get lost in translation, or it's not inaccessible. So like thinking of buildings, since we're on the topic, like entrances for people in wheelchairs, stuff like that to keep in mind.

Social sustainability is a pretty good way to phrase equity. I like that turn of phrase. So you've been studying sustainability this semester?

Yeah, we have four projects and they're all kind of interconnected and have to fall under this theme of sustainable living. So everyone's projects aren't completely like, everywhere. Because we are submitting, or some of us are submitting, for BFA applications so they kind of want to keep it all level I guess.

How would you determine if something has been designed sustainably?

It depends because when I think of determining if something is sustainable or not, I kind of think of… you know the idea of greenwashing? How it's supposedly sustainable but it's not. I guess it's kind of hard to figure out because it is so easy to just be deceived by big companies. So I guess I don't know. I haven't really thought about that before. It's tricky. It's tricky using just your creative judgment. And obviously, what we might think is designed sustainably now – in the future we might completely change our minds. Or we might learn more and then we realize that what we thought was sustainable wasn't. So yeah, I'm not sure how to answer that.

All right, how about what if we change the adjective to responsible, like what does it mean for you to design responsibly?

Responsible is like a heavier word so I think more like… implications. "Design responsibly" means including language that might not be offensive. Visual representations that are right for the time. And I guess like, the research aspect as well because design does require a little bit of research – making sure that it's not misinformed. Because design is putting things visually because that's probably the easiest way for people to consume information. So if it's wrong and it's designed in such an accessible way, then it's easier for people to get misinformed. So I think having reliable sources of information, making sure things aren't misconstrued, would be responsible design.

Thanks, that's a good definition for designing responsibly. So how would you recognize if you felt like something wasn't designed responsibly?

First thing would be just like gut instinct. Being on social media, and having access to the internet, and being able to see different points of views, and seeing what might be considered responsible–should we share or not–has kind of allowed me to make a good guess just based on how it makes me feel. If I get a visceral reaction. I'm like, "yeah that doesn't look right." Or maybe that representation seems like it stems from something kind of problematic. So I guess just, that reaction and also building from past mistakes, or more invisible things because I guess design is based on inspiration – like you get inspiration from everything. So everything just takes new form but you would still be able to see the original influences. And if you feel like those influences weren't responsible or were from something that doesn't seem too responsible. That would be a good indicator.

Yeah, these days we all have to hone that gut instinct. Thank you. So the next few questions are just quick. Fill in the blanks.

When I think about the future I feel:

Nervous.

Is it good anticipatory-nervous or more like, "oh what's going to happen?"

Yeah. Even just on the topic of sustainability, I feel like we are so far from where we should be in terms of sustainability. Just thinking about the planet and climate change… stuff like that. So I feel kind of nervous, and seeing the progress that isn't being made; that should be really alarming. How powerless we are in the bigger picture to affect bigger powers and how little power we have, you wouldn't think that we do have greater power. It doesn't make sense – we think we're making this big change because it's been fed to us like, "do all this stuff and it'll be fine," but then when you think about it just like… you're kind of like, something's not adding up. So it's just very scary.

When I think about climate change, I feel:

Oh, um, what's it… Betrayed? Maybe.

Betrayed!

It's because… I don't know, it's just like, even going back to the concept of greenwashing. The fact that corporations are taking advantage of something that is supposed to be enacting actual change and then just using that to make things worse or make them look better just for a second. It's an insane thing to think about. And it just really makes you think, how deep do you really have to go to change? It's not just like a surface level thing. It's like, you really have to dig into the roots. To enact change.

It's thorny for sure. Thank you.

All right, when people see my work in the future, I want them to think:

"Wow!" Something that I want to do with my design, I guess, is just to open people's minds and be like, wow, I didn't think of that like that. Because whenever I see a design like that, or just designs in general, I would think, "wow, I didn't think of representing an object like that or adding elements like that and using different typeface things like that in that way." I want people to think, "I never thought about that" or "that encapsulates everything in my head, but visually." Yeah. Just "wow." Pretty simple, I guess.

Yeah. I think that's great. That's all I've got. Thank you so much. I really appreciate it.

Marc O'Brien

Designer and co-founder of Climate Designers, Lecturer at California College of the Arts

This interview edited for length and clarity.

Cindy: So you're the first person who's explicitly made this connection between sustainability and punk rock. But it's so true that if you grew up with that kind of ethos, it speaks to sustainability and equity and questioning authority. That's really cool.

Marc: I mean, that's a whole other conversation, but yes, there are a lot of parallels and in my free time I watch not just climate documentaries, but also punk documentaries and tying that thread between the two makes sense for me. And I just so happened to stumble into punk rock in seventh grade. And then this [Climate Designers] was really a byproduct of that. The social innovation stuff was the same thing, right? Recognizing systems that are benefiting a few at the detriment of lots of people, and degrading ecosystems. I mean, all that stuff. But yeah, the parallels are all there.

What's your background in design? Industrial? Physical?

I have a degree in, back in the day it was called IT Web Development, which is basically web design, web 1.0. And then I went back to school to get a second degree in graphic design. But these days, I'm much more on the strategy and creative direction side of things. I shine bright at the intersection of design and business, obviously through the lens of climate.

In relation to Climate Designers, which you are a co-founder of, what would you say is the number one priority of that organization?

Top priority right now is to get it funded. We have big, big, big plans and ideas that we really can't do as a volunteer-led organization. We're not in it for shits and giggles. I can be doing a number of other things in my downtime. I can volunteer for lots of other initiatives and causes. We are–and this was from the very beginning–we are wanting to fundamentally redesign the design industry. And that is no small task. So getting funded is top priority. When it comes to our members, upskilling their knowledge around their role and influence as designers to show them that they have an amazing set of skills that shape culture and shape the world around us. And that power and influence should be used for good. And with a little bit of knowledge around how they are showing up to climate, understanding things like regenerative design, environmental justice, even indigenous wisdom practices, it can really help them move their practice forward in a better way. We're not trying to go in-depth with any one discipline, because we're kind of cross-discipline as a community. But what we're trying to do is build up the scaffolding around every designer in our community to prop them up to become climate designers.

And in your work as an educator at CCA, do you teach these sorts of things to the students there?

Yeah, I teach a class called climate designers.

Is it required?

Unfortunately not. It's an elective and I teach it to undergrads and grads in the graphic design department, and the interaction design department. It is not required. It is an elective. But my dream for a class like this is to be taught at the foundational level so that every student, before they enter their design department, can go through a class like this so that it's not just a little fun elective that a few students take, but that every design student takes.

That is really cool. I'm having a hard time finding non-elective sustainability classes in the design curriculum.

Yeah, it's unfortunate. You know, it's the same thing as an ethics class. It's got to be a class. It should be ingrained in every class. And it mirrors corporate America where you have the sustainability department. And it's like, why are we treating this as a checkbox, right? Why shouldn't this be integrated in all design schools, all companies? And I think we'll get there. I do believe that we are starting to see more and more of that. It's slow, but I think it's going to start to ramp up because businesses know that you can't do business on a dead planet. No one's going to give a shit about your subscription box of cookies when a wildfire is approaching their house. And so customers, audiences, the people that are engaging with your product and service or experience, they're going to be preoccupied with just keeping their families safe and just, you know, being alive. And if companies want to stay around, they need to step up and do something.

Yeah, for sure. I think as designers, we can see how we're kind of uniquely positioned to tell these stories about climate and to integrate sustainability into our work. Do you feel that businesses understand that as well? Or do you find that you have to talk to businesses and go, "hey, this is what designers can do in the realm of sustainability?"

It depends. There's been a number of reports from the McKinsey's and the Deloitte's[30] of the world where companies are waking up and understanding the perception of sustainability or climate in their work, and that people are willing to pay extra money for a product or service or experience that goes towards a company that is doing something. I mean, I think McKinsey did this.[31] You know, Gen Z are willing to pay extra money. They're even willing to take a pay cut to work for companies that might not pay as well as a non-climate company or non-mission-aligned company, but at least they know that they're actually on the right side. So I think there are certain companies out there that are doing that. And there's lots of early-stage companies that have just baked it into their DNA. A lot of the dinosaur companies are scrambling to try to figure out how to inject that into their companies because they weren't founded on that. So it's not in their DNA. Some have been more successful than others. And then when it comes to clients and things as individuals, you know, freelance designers, working directly with clients who call the shots, or at least pretend to. Again, it depends. Some clients get it, and others don't. Luckily, there's a lot of resources out there. And some of them have been floated in our community that informs designers on how to make the business case that, hey, doing this option versus that option. Yes, it might be more expensive, but here are the positive results. And again, this is where persuasion and leadership really come in, which is something that we really want to bring into the community.

When you think of design students, you know, fresh out of their undergrad program, what sorts of skills would you say are appropriate for them to leave school with in relation to climate design or sustainability or equity, that would make them... I don't want to say marketable. But, you know, so many undergrads are kind of like, I just want to get out and get a job and now get paid to do what I love to do.

Yeah, and they can do that. And the likelihood of them waking up after a year or two of doing that and realizing, "This sucks. I actually do want to do something that is mission-aligned or that amplifies my values." I think they'll realize that on their own. But I don't think we can afford that, in terms of time. So I think for those who are wanting to leave school with that mission-aligned approach to try to find companies, I think some of the things that they can do to "be marketable" would be just to jump in and learn the basics of climate sustainability, you know, attend YouTube University. That's how I learn a lot of this stuff, right? Read books, read articles, listen to podcasts. I mean, fortunately today, in 2024, we have so much information on climate now that you can really just pick where you want to jump in. And with all that might come paralysis, like, "Oh, I don't know what to do." There's a great resource that I share with my students at the start of every semester and with others. It's called *The Climate Action Venn Diagram*, popularized by Dr. Ayana Elizabeth Johnson. It's a very similar approach to Ikigai. She gives a TED talk[32] about it and why it's important. It's super simple, but at least that is one of many tools that will help someone focus their energy and efforts. So this way, they're not just scrambling to find something, they can find something that is aligned with mission values, what brings them joy, what they understand, what needs to be done, what they're good at, stuff like that. And then, at the same time—and I've said this even before jumping into climate—designers need to have an understanding of business. Business hires us—you know, we don't solve design problems, we solve business problems using design. Just having a very basic understanding of how business works helps them stand out.

One of the questions that I've been asking of undergrad students, and that I have been asked, is how do you know that something is sustainable? Or for me, it's like, how do we measure the impact of what it is that we're doing?

Lots of ways to answer that. I mean, there's a lot of these calculators out there, there's, life cycle analysis. I mean, if you want the hard data, there's things out there that can measure that, although, I hope this changes, but many of them are not as accurate as we think they are. Another way to answer this, which is something that isn't really part of the 'how to measure sustainability' conversation, would be the cultural shifts and the behavior shifts, right? I think that's as important as the hard data. I think a lot of what we're addressing here is behavior design, which is something that I don't think is taught or even talked about in the design community at all. Regardless of climate or not climate, even just basic design, you are designing people's behaviors. We need to pay more attention to that. But then how do you measure that? How do you actually understand where you started and where you ended with your design in that regard? I'm sure there's ways to measure that. I think you've just got to be a little creative and think a little bit harder on what that looks like. But yeah, if you can try and measure it, which you should aim for, then measure it. And if you can't, then just try to figure out what the more invisible stuff is. But it's a tough question. I don't know. Lots of ways to answer that.

I've been looking at, you know, there's the nine planetary boundaries. There's the UN's 17 Sustainable Development Goals. And those are nice because they're global goals and metrics. And we have very concrete data on them. But it's kind of a lot to throw at undergrads, I think.

Yeah, or anybody really. But I think two examples that you shared are great. But there's still the question of, how do you actually measure that? I think the nine planetary boundaries, I think that sets itself up for success because there are actual hard numbers to crunch and data to look at and to then measure. I think the SDG's, they're a little bit fuzzier, but still measurable in some ways. But yeah, I think it's a case by case scenario. It's tough to answer that.

Interesting. Yeah, I was reading the Climate Designer principles. "All design must create measurable change." That's just great.

Like, it's what we strive for because we need to understand if the thing that we're doing is making a difference. But I think at the same time – and I teach this in my class, it's one of the first presentations I give at the start of every semester – sometimes you'll have those unintended consequences. Oops, you know, didn't think about that one. And that's something to look out for. And Mike Monteiro,[33] who is up in the city, he speaks a lot about that.

Yeah, he's an author, correct?

He wrote a few books, the one that I'm thinking of that speaks to that is Ruined by Design. It's a great book. You can read it in like a week. It's super short. He just versioned it in newsprint; It's like 10 bucks on his website.

Oh, that's really cool. Okay. Let me see. We've covered a lot. Thank you so much for speaking with me today.

[30] Deloitte, Ucuzoglu, and Steinmann, "Deloitte 2023 CxO Sustainability Report."

[31] "What Is Gen Z?"

This report is from 2024, but shows findings similar to what Marc speaks of.

[32] "Climate Action Venn Diagrams – Ayana Elizabeth Johnson."

[33] You should read everything he's written. https://www.mikemonteiro.com/

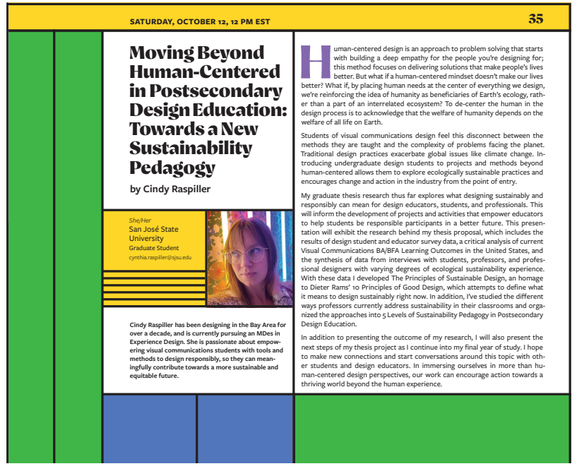
Phase 2

Analysis & Synthesis

Developing frameworks, guidelines, and plans

PHASE 2: ANALYSIS & SYNTHESIS

In phase two, the data from phase one was synthesized into three frameworks for making sense of sustainability and climate resilience in design education. An homage to Dieter Rams' 10 Principles of Good Design, *The 7 Mindsets of Climate Resilient Designers* are written as learning objectives and define multifaceted knowledge and practices necessary to build climate resilience. In addition, the different ways professors currently incorporate concepts of sustainability in their course assignments have been organized into *5 Levels of Sustainability Pedagogy in Design Education.* Finally, the project's target audience and design guidelines are based on qualitative data from professor interviews.



SATURDAY, OCTOBER 12, 12 PM EST 35

Moving Beyond Human-Centered in Postsecondary Design Education: Towards a New Sustainability Pedagogy

by Cindy Raspiller

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Cindy Raspiller has been designing in the Bay Area for over a decade, and is currently pursuing an MDes in Experience Design. She is passionate about empowering visual communications students with tools and methods to design responsibly, so they can meaningfully contribute towards a more sustainable and equitable future.

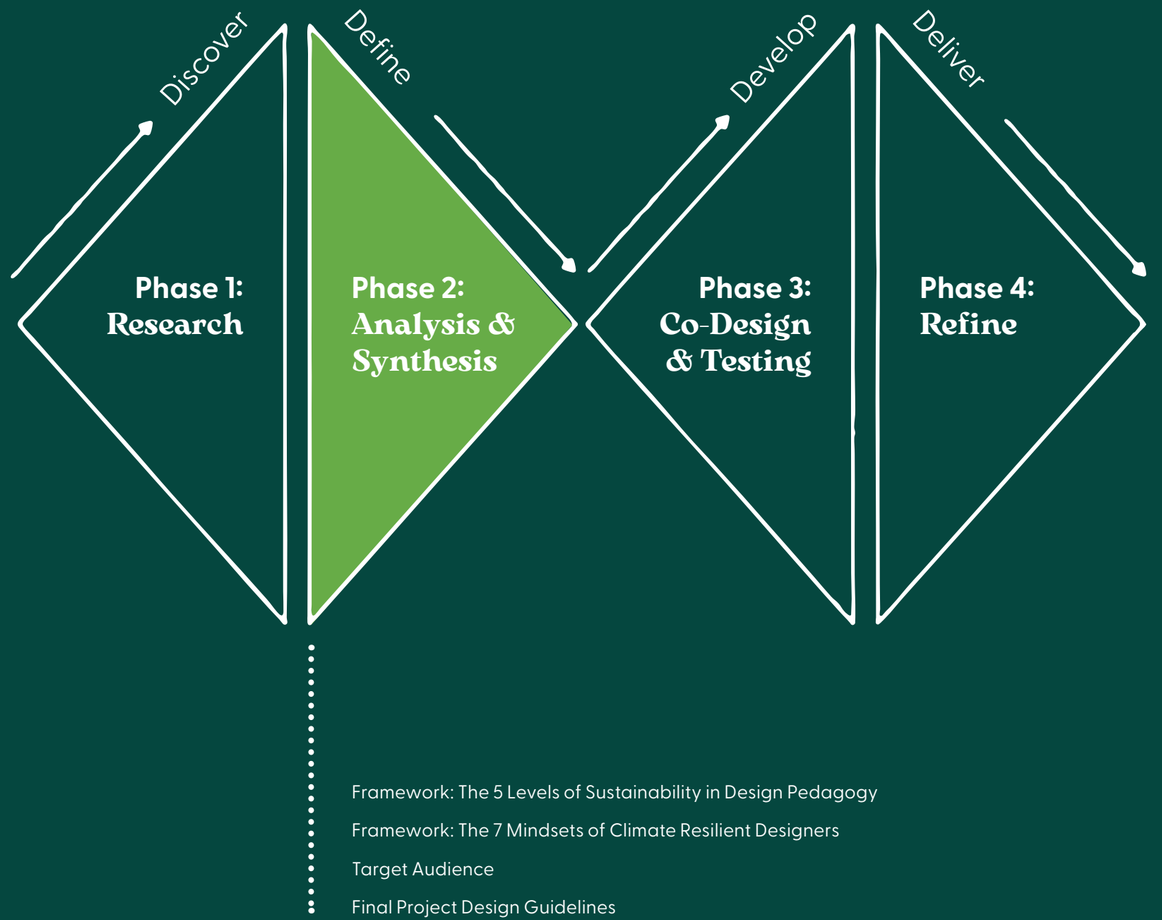
Human-centered design is an approach to problem solving that starts with building a deep empathy for the people you're designing for; this method focuses on delivering solutions that make people's lives better. But what if a human-centered mindset doesn't make our lives better? What if, by placing human needs at the center of everything we design, we're reinforcing the idea of humanity as beneficiaries of Earth's ecology, rather than a part of an interrelated ecosystem? To de-center the human in the design process is to acknowledge that the welfare of humanity depends on the welfare of all life on Earth.

Students of visual communications design feel this disconnect between the methods they are taught and the complexity of problems facing the planet. Traditional design practices exacerbate global issues like climate change. Introducing undergraduate design students to projects and methods beyond human-centered allows them to explore ecologically sustainable practices and encourages change and action in the industry from the point of entry.

My graduate thesis research thus far explores what designing sustainably and responsibly can mean for design educators, students, and professionals. This will inform the development of projects and activities that empower educators to help students be responsible participants in a better future. This presentation will exhibit the research behind my thesis proposal, which includes the results of design student and educator survey data, a critical analysis of current Visual Communications BA/BFA Learning Outcomes in the United States, and the synthesis of data from interviews with students, professors, and professional designers with varying degrees of ecological sustainability experience. With these data I developed The Principles of Sustainable Design, an homage to Dieter Rams' 10 Principles of Good Design, which attempts to define what it means to design sustainably right now. In addition, I've studied the different ways professors currently address sustainability in their classrooms and organized the approaches into 5 Levels of Sustainability Pedagogy in Postsecondary Design Education.

In addition to presenting the outcome of my research, I will also present the next steps of my thesis project as I continue into my final year of study. I hope to make new connections and start conversations around this topic with other students and design educators. In immersing ourselves in more than human-centered design perspectives, our work can encourage action towards a thriving world beyond the human experience.

I had the opportunity to present phase two of my research at the Design Educators Community track at AIGA's 2024 conference, Margins. At that time I was still referring to this research as "Beyond Human-Centered," but I was moving steadily towards my phase 3 research plans and developing the final project.



THE CURRENT STATE OF SUSTAINABILITY IN VISUAL COMMUNICATION DESIGN EDUCATION

The institutions of design, like the institutions of almost everything else, are still in a weird transitional upheaval in the aftermath of the pandemic. People still hesitate to attend large gatherings in person, much less pay for them. Most gatherings are done virtually. The funding available for groups such as AIGA is running low due to almost 4 years of instability and low attendance, and so other design initiatives suffer (Compostmodern[34], *The Living Principles*[35]). Sustainability, a popular concept at the start of the millennium, seems to have lost steam. Popular sustainability movements and methodologies–Renourish,[36] Okala Practitioner,[37] Designers for Climate[38]–have been paused or not updated. Climate Designers,[39] a group of folks dedicated to motivating designers to take action on climate issues, is growing. Many professors I interviewed saw sustainable design as passé, as if we can move onto the next fad and the health of our natural systems will move on as well. Many students interviewed reported feeling anxious about the future, and unsure how their work could help. Professional designers who are not actively working in a sustainability-focused studio tend to feel as though sustainability initiatives are not supported by the C-suite, and they are unsure how their work, which feels very unsubstantial in nature, could make a big difference in the fight against climate change.

There are pockets of sustainability work in postsecondary visual communication education. Many professors make an effort to address sustainability in their pedagogy. This is done through a patchwork of methods and approaches, with varying levels of effectiveness. In phase 2, insights from my interviews and the analysis and synthesis of my research helped me to develop frameworks to make sense of the data I was getting and organize it in a compelling way. The 5 Levels of Sustainability Pedagogy in Design Education organizes the many ways visual communication educators are currently approaching sustainable or climate resilient pedagogy in their classrooms. These levels not only give a snapshot of how things are currently taught, but they are an additional framework for organizing the methods I've included in the Shift deck. The 7 Mindsets of Climate Resilient Designers are learning objectives that helped me organize my thoughts around how those I've interviewed and the books I've read define sustainable design. Sustainability means different things to different people, and we'll need folks with practices anchored in all seven of these mindsets to create change and grow resilience. The mindsets also anchor the learning objectives and outcomes that are a critical part of the Shift deck. Lastly, my interviews with professors provided insight into their pedagogical strategies and pain points. These insights informed the development of my thesis project's design guidelines–a framework for the necessary attributes this project must have in order for it to meet the needs of my target audience, visual communication professors.

The 5 Levels of Sustainability Pedagogy in Design Education: **Content / Message / Material / Complexity / Critical Inquiry**

Examining the different ways professors currently address sustainability in their classrooms helped me organize the approaches into five levels. These levels are not necessarily hierarchical, but do convey a sense of progression in terms of the level of student engagement with sustainable concepts and methods. The levels do not apply to projects in isolation, either; projects and exercises could certainly fall into more than one level, and those levels do not need to be consecutive to apply. The project examples shown here were either available through the AIGA DEC teaching resources website, or I received permission to include them here for reference.

Exploring and categorizing ways to give students more confidence and awareness around sustainable methodology could go a long way in moving the design industry and design culture towards a space where sustainable methods aren't a "nice-to-have," but a necessary part of the design process.

[34] Compostmodern is still online at compostmodern.org.

[35] Werbach, "Designer's Roadmap."

[36] Renourish came back online sometime in 2024, and I was so happy to finally read about it. Learn more at re-nourish.org.

[37] As of this publishing, www.okala.net is no longer active.

[38] It doesn't seem like an active group, but you can learn more at designersforclimate.net.

[39] Climate Designers is a great group of people who are passionate and active in the climate space. In fact, I'll be continuing this research as a strategist with their New Wave Research Project. Learn more at climatedesigners.org.

Content

SUSTAINABILITY AND CLIMATE RESILIENCE AS PASSIVE CONTENT

When teaching design concepts such as typographic hierarchy or layout, professors may choose to provide students with content that speaks directly to the climate crises or other sustainability issues. This passively brings the content to the student's attention, but doesn't necessarily invite any further consideration.

This level may be the most effective way to approach sustainability at the most fundamental levels of design education, when students are learning basics such as layout, typography, shape, and balance. Surprisingly this is not a commonly used method for incorporating sustainable content into design teaching, but it is certainly a great place to start for instructors who may feel unsure about some of the other levels.[40]

"I try to fold in science like, 'let's redesign the periodic table so that you're learning something about science and then you're going to make this poster.' But then, where does a poster live later?"

– Design Professor, Interview #18

"From a pedagogical perspective, I think an interesting way to approach sustainable design in secondary education is thinking about–what is content that can be dropped into existing projects that forces people to confront or ask questions or be critical of the climate, the information around the climate crisis."

– Design Professor, Interview #21

[40] In fact, I was unable to find examples of this method during my research, though it was often brought up as a possibility.

5 Levels of Sustainability Pedagogy in Design Education

Message

SUSTAINABILITY AND CLIMATE RESILIENCE DELIVERED AS A MESSAGE

Students may be asked to design a project that delivers a message about ecological sustainability–this is usually a data visualization, poster, or awareness campaign. Some students feel a disconnect between the urgency of the sustainability movement and the lack of measurable action their own project takes.

This is the most common way sustainability is woven into visual communication curricula. Students of visual communication are taught that their competency and talent is in visual storytelling, and they should use their skills to tell the stories they think are important. This is where my design brain would often get stuck–because, when your job is to be a designer, you don't have a lot of control over the stories you get to tell. You're paid to visually communicate what others need you to communicate. Young designers often don't have the time or energy to focus on passion projects; those entry-level assignments can require so much effort for such little pay. There is something to be said for choosing clients whose stories you think are important, but preaching sustainability without practicing it can feel hollow, especially to students and professionals who really do want to practice climate resilience.

"Ironically, we're working on a sustainability project, but I feel like we're not actually learning the basics of how to actually sustainably create."

– Design Student, Interview #5[41]

"The visual messaging is really... it's the easiest thing to do and it has the least amount of impact."

– Design Professor, Interview #22

[41] So many students echoed this sentiment. So many professionals lamented this perspective. We're told that effectively communicating Important Messages is enough–is Good Work–but too often those important messages seem to
1. Fall on deaf ears, and
2. Talk the talk, but not walk the walk.

Left: A project I created for a graduate seminar design course in December 2024. The poster delivers an educational message about a biological process–foliar uptake–with the intent of highlighting the threat that climate changes poses to the habitat and water course of California's coastal redwood forests. This is an example of design delivering a message of climate resilience.

5 Levels of Sustainability Pedagogy in Design Education

Material

SUSTAINABILITY AND CLIMATE RESILIENCE AS A MATERIAL CONCERN

Students learn about sustainable production practices such as using alternative papers, eco-friendly inks, second-hand materials, and alternative finishes. They learn about local recycling requirements and limitations, and may explore concepts of carbon footprints. This comes with an understanding that digital does not equal sustainable–our digital artifacts require massive amounts of energy to exist. Students may learn how to optimize images for digital use and understand sustainable web design best-practices.

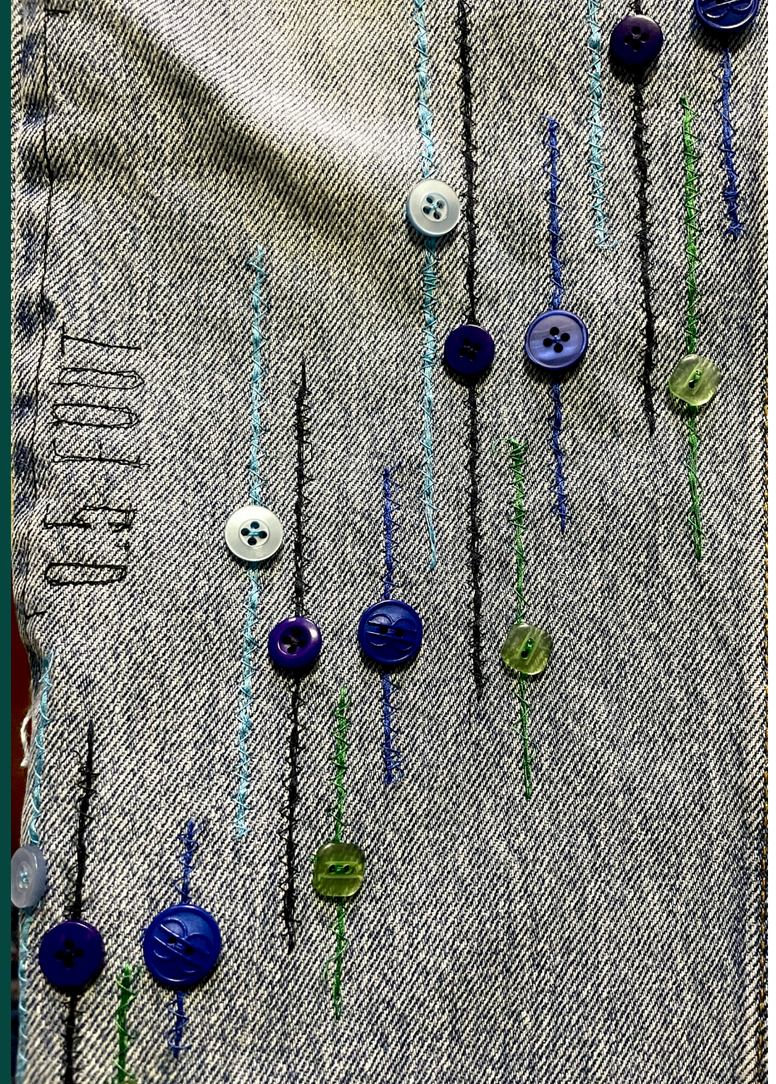
Often, level three is taught because students might be learning about print production–which means it is also often taught in an elective course. Many students are aware that they can recycle their paper, use papers made with alternative fibers, or use eco-friendly inks. Many students are also very aware of the energy they use to produce their design work on their computers, and actually feel remorse that they can't work quicker to complete a project. Most students I spoke to were unaware of how finish (metallic, UV coating, etc.) can affect the recyclability of a product, and students also weren't aware that recycling requirements vary wildly by location. Honestly, I didn't know that, either. Most professors place more importance on their student's design skill rather than their production know-how.

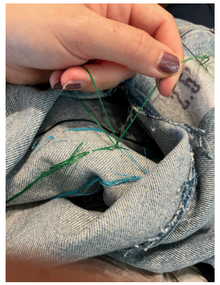
"There are more tools [for measuring sustainability] right now, like carbon calculators. And there are even existing tools specifically designed for creatives in terms of carbon calculation and greenhouse gas emissions."

– Professional Designer, Interview #17

"I think of implementing sustainable values as like, how much ink or paper I'll produce, or how much the carbon footprint would be affected by designing this."

– Design Student, Interview #6





Left: Titled *Sea Level Rise*, this is a project I created for a course in data and technology in design in October 2024. I used materials that were secondhand, or that I already owned, plus 100% recycled thread, to create a data visualization sewn onto a pair of pants.

Sea Level Rise is designed so the current and projected amount of sea level rise over the next 100 years maps directly onto the pant leg. The average projected rise is represented by a button (donated from my mother's stash) sewn directly onto the pants. This allows the wearer to have a visual and tactile connection with the sea level mapped directly onto their body. While the method was labor-intensive, the material used were very sustainable.

5 Levels of Sustainability Pedagogy in Design Education

Complexity

SUSTAINABILITY AND CLIMATE RESILIENCE AS A LENS FOR UNDERSTANDING COMPLEXITY

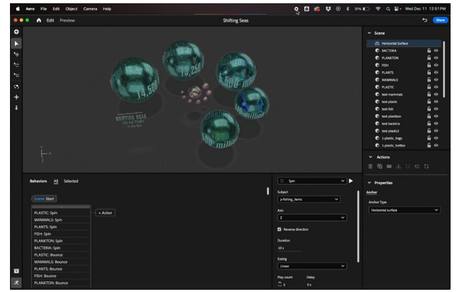
Understanding how the systems that support us are interconnected, and working to transition those systems towards more sustainable and equitable goals are often cited as key strategies for addressing global issues such as climate change. Design priorities at this level might include concepts like Lifecycle Assessments and Cradle-to-Cradle[42] thinking.

This kind of pedagogy is often considered to be in the realm of design thinking or environmental science, and so is not something often broached in visual communication or graphic design. I would argue that visual communication design students are primed to be great at understanding and making visual sense of complex relationships Concepting, iteration, and research are all necessary skills for successful design and successful systems thinking. Many students of industrial design are introduced to lifecycle assessments during their education; there's no reason visual communication students can't also study and optimize the lifecycle of their printed, digital, or packaged creations. This kind of transparency is necessary to drive change. Many lifecycle and systems maps can also benefit from the eye of a graphic designer; the skill to understand these maps and also clearly visually communicate their value cannot be understated.

> "It's not just that we know how to use Adobe or whatever, but it's how we think, right? It's how we ideate and how we take what was asked of us and find not just one solution and one answer, but multiple solutions."
>
> – Professional Designer, Interview #1

> "So one thing is to have a way to measure sustainability. Lots of data. And one way for product designers to evaluate sustainability is to evaluate the product life cycle."
>
> – Design Professor, Interview #24

[42] McDonough and Braungart, *Cradle-to-Cradle.*



Left: Titled *Shifting Seas: Life and Plastic in the Ocean*, this is the final project I created for a course in data and tech in design in December 2024. In attempting to visually display the amount of plastic in the ocean compared to the amount of biological life, I researched the true complexity of the problem of plastic waste. It is disposed of in a myriad of ways and the existence of plastic waste in the ocean disproportionately affects economically disadvantaged populations. We cannot truly break it down into a nice neat number, but can merely make an educated guess at the enormity of plastic in the ocean.

Critical Inquiry

SUSTAINABILITY AND CLIMATE RESILIENCE AS A CRITICAL INQUIRY

Professors may dive deeper into sustainable inquiry, exploring abstract concepts, processes, and aesthetics related to sustainability and visual communication. Critical thought experiments might use design to question the status quo, explore methods of reuse and regeneration, and explore personal and societal values.

This level is a little harder to define, but that is because it encompasses all we don't really have defined for us regarding sustainability and climate resilience. Experts are unable to give us concrete steps to design sustainably, and sustainable practices are constantly questioned and revised. Students of visual communication should be given space and time to explore some of these more abstract concepts. Is recycled paper more sustainable than FSC-certified paper?[43] How can my design work be reused/reduced/recycled/regenerated? Does climate resilient design have an aesthetic? How do cultural values affect climate resilience? What will a climate resilient future look like?

"It just really makes you think–how deep do you have to go for real change? Like, it's not just a surface-level thing. You really have to dig into the roots. To enact change."

– Design Student, Interview #11

"So what else can we do, as graphic designers, in material exploration, process exploration and aesthetic exploration? Should sustainability have a different set of aesthetics than modernism does?"

– Design Professor, Interview #21

[43] Some argue that the facilities, materials, and energy needed to recycle paper actually make its carbon footprint larger. Dichotomies such as this are what make climate resilient design practices so hard to solidify.

FROM SUSTAINABILITY TO RESILIENCE

Sometime after creating the 5 Levels of Sustainability Pedagogy in Design Education, I started to shift away from the concept of sustainability as the driving force behind my project. At this point, designing sustainably is not going to stop climate change. Inspired by my internship with San José's Climate Art Program, I shifted my focus to designing for climate resilience. Sustainability implies that there is something we wish to maintain, but the damage to be wrought by climate change is no longer able to be solved by maintaining our current systems. Resilience implies strength in the face of adversity, and it implies maintaining that strength over time. My project works to embed resilience in design education in the form of mindsets, ways of thinking that translate into ways of being.

The 5 Levels of Sustainability Pedagogy are relevant, in that they address ways sustainable concepts are taught. However, my iterative testing process showed that the concept of "levels" was confusing. Professors assumed the Levels of Sustainability Pedagogy mapped onto levels of student learning, which is not entirely accurate. If anything, the levels can be considered as levels of engagement with sustainable or climate resilient methods. To remedy this, I removed numbering of the levels, which was present in previous iterations.

The 7 Mindsets of Climate Resilient Designers: **Beyond Human-Centered / Economy / Engagement with Policy / Honesty & Optimism / Hyper-Localization / Systems & Transitions / Trans-Disciplinary**

In their first (and honestly, second and third) iteration, these mindsets were principles. Inspired by Dieter Rams' *10 Principles for Good Design*,[34] I sought to define the principles of sustainable design. As my thesis project shifted away from sustainability and towards climate resilience, "principles" seemed too rigid and dogmatic. Resilience implies strength in the face of adversity, and it implies maintaining that strength over time. My project works to embed resilience in the form of mindsets: ways of thinking that translate into ways of being. Ways of being that embody what it will take to survive and thrive in a world defined by climate change.

Learning Objectives

The mindsets are written as learning objectives. In her book *Teaching Design*, Meredith Davis defines learning objectives as, "the student competencies necessary for goal achievement, describing what faculty expect students to know, value, and be able to do." Each mindset is represented by a biological strategy that embodies the spirit of the mindset. I collected most of these concepts from AskNature.org, a project by the Biomimicry Institute. Janine Benyus introduced the world to the concept of Biomimicry in her 1997 book, *Biomimicry: Innovation Inspired by Nature*. Biomimicry observes how nature solves design problems and uses that knowledge to approach problems in a more regenerative way. Nature is a perfect place to look for ways to visualize these mindsets in actions, because nature is resilient.

I present these mindsets as a fluid framework to hang climate resilient design onto. They may evolve as our understanding of climate change evolves, and that's expected. They are stylized as learning outcomes, and visual communication educators may think of them as such if it serves their pedagogy. I don't consider them to be exhaustive, and even plan to add more in the future. The concept of pluriversal design deserves a place in these mindsets, as does equity. As of this writing they exist somewhere between the mindsets of Beyond Human-Centered and Trans-Disciplinary, but the current discourse on equity in design deserves to be explored by those whose lived experience can speak to it. This is a topic that deserves its own thesis project(s), and one I will continue to include in my research into climate resilient design throughout my life's work.

[44] "Dieter Rams: Ten Principles for Good Design."

Good design:
1. Is innovative.
2. Makes a product useful.
3. Is aesthetic.
4. Makes a product understandable.
5. Is unobtrusive.
6. Is honest.
7. Is long-lasting.
8. Is thorough down to the last detail.
9. Is environmentally friendly.
10. Is as little design as possible.

THE MINDSETS: A FRAMEWORK

The mindsets converge and overlap into a framework that helps situate design within a broader context. This framework organizes the mindsets into 3 categories of thought that encourage visual communication design students to expand beyond aesthetics and user needs to consider the effect their work can have in terms of *values*, *systemic realities*, and *influence*.

Values

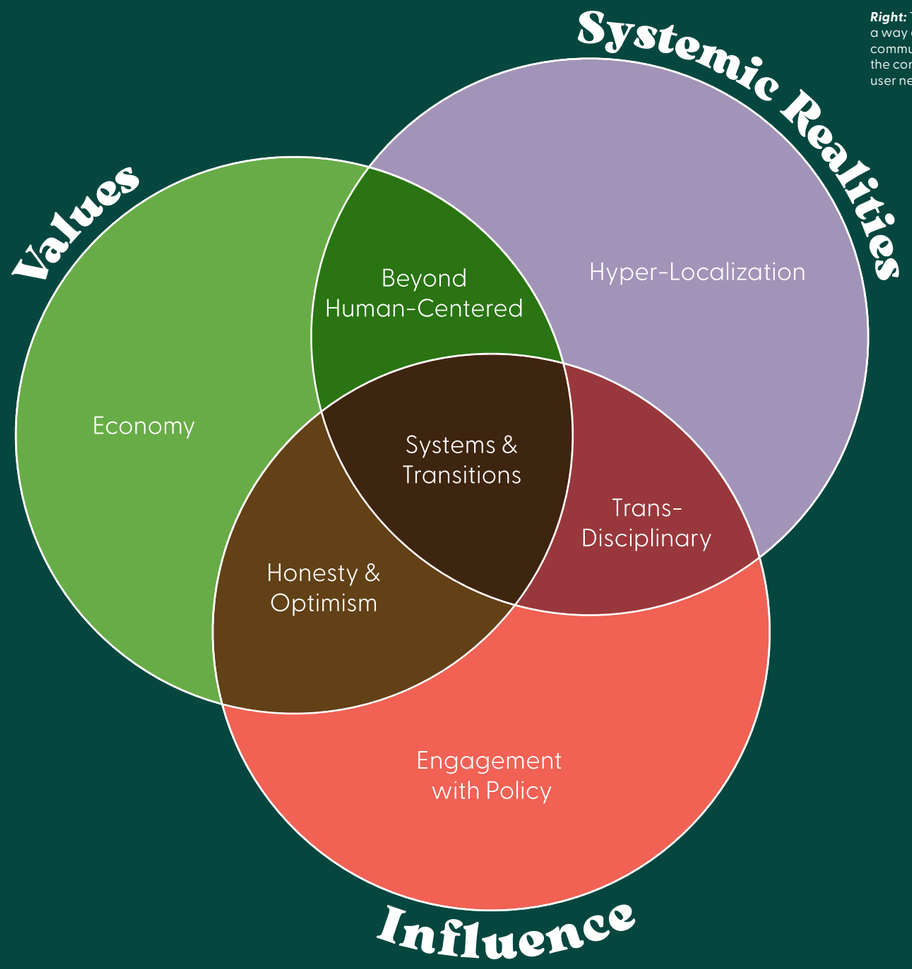
Mindsets concerned with Values help designers see the impact of their work beyond a dollar figure.

Systemic Realities

Mindsets concerned with systemic realities help designers see their work as part of an interconnected, meaningful whole.

Influence

Mindsets concerned with influence help designers see themselves as agents of positive change across disciplines and with institutions, policies, and systems of power.



Right: This framework presents a way of thinking about visual communication design beyond the concepts of aesthetics and user needs.

7 Mindsets of Climate Resilient Designers

Beyond Human-Centered

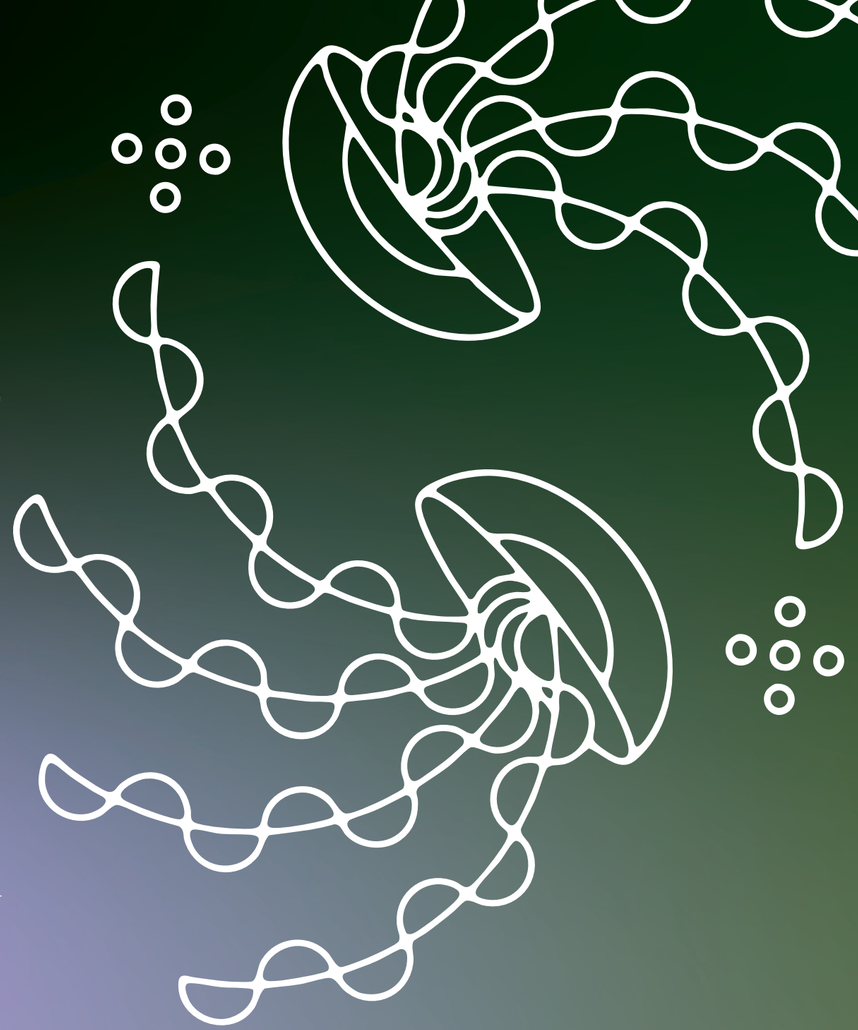
"Recognizing our true place in nature gives us new responsibilities. We discover that caring for the natural world is the same as caring for ourselves. It also opens up new opportunities: by synergizing with nature, instead of opposing it, we can release enormous creative potential. That is what launches a new era of design."

— Bruce Mau, *MC24*. page 137

Students develop a holistic view of their role as an interrelated part of the natural world, and are prepared to design in a way that considers and nurtures the interdependence of all life. Students learn actionable strategies to incorporate empathy for living beings and natural ecosystems into their design processes.

To de-center the human in the design process is to acknowledge that the welfare of humanity depends on the welfare of all life on Earth. Students develop a holistic view of the context of their work, and are prepared to design in a way that considers and nurtures the interdependence of all life. Students incorporate empathy for living beings and ecosystems into their design processes and learn actionable strategies for broadening the definition of "user" to include all nonhuman participants in their design projects. Students consider the needs of technologies as an integral part of the context of their work that has a measurable effect on natural ecosystems and well-being.

My entire thesis used to focus on beyond human-centered design, or more-than human-centered design. Now, it feels appropriate as a mindset in service of the larger goal of climate resilience. Designing beyond the scope of human-centered is not a new idea; Damien Lutz has laid claim to Life-Centred design, and entire educational ecosystems have arisen to teach these methods and concepts to those who wish to learn them. Planet-centered design, Earth-centered design, more-than-human design, multispecies design–all terms for the idea that, by focusing only on the needs of humans, we've ignored the needs of everything else on Earth. To the detriment of everything on Earth.



"If you have this larger idea of how you approach things, and one of the ideas is that you do no harm, then that really gives you a way to think about things and the kind of choices you make"

— Design Professor, Interview #16

Biological Strategy

The deep ocean is perhaps the only place on Earth where humans are not present. Except maybe for the plastic littering the ocean floor, the ocean is a place devoid of human activity. The beings who call this place home have no concept of humanity, and get along quite fine without a notion of what exists above them. In fact, they'll likely continue to get along just fine until well after we're gone. They operate in a space that is truly beyond human-centered.

7 Mindsets of Climate Resilient Designers

Economy

"By the time a design goes into manufacturing, it is usually too late to make the production process more efficient. The designer needs to learn about manufacturing processes and plan ahead."

– Dougherty, Brian. *Green Graphic Design*, page 104

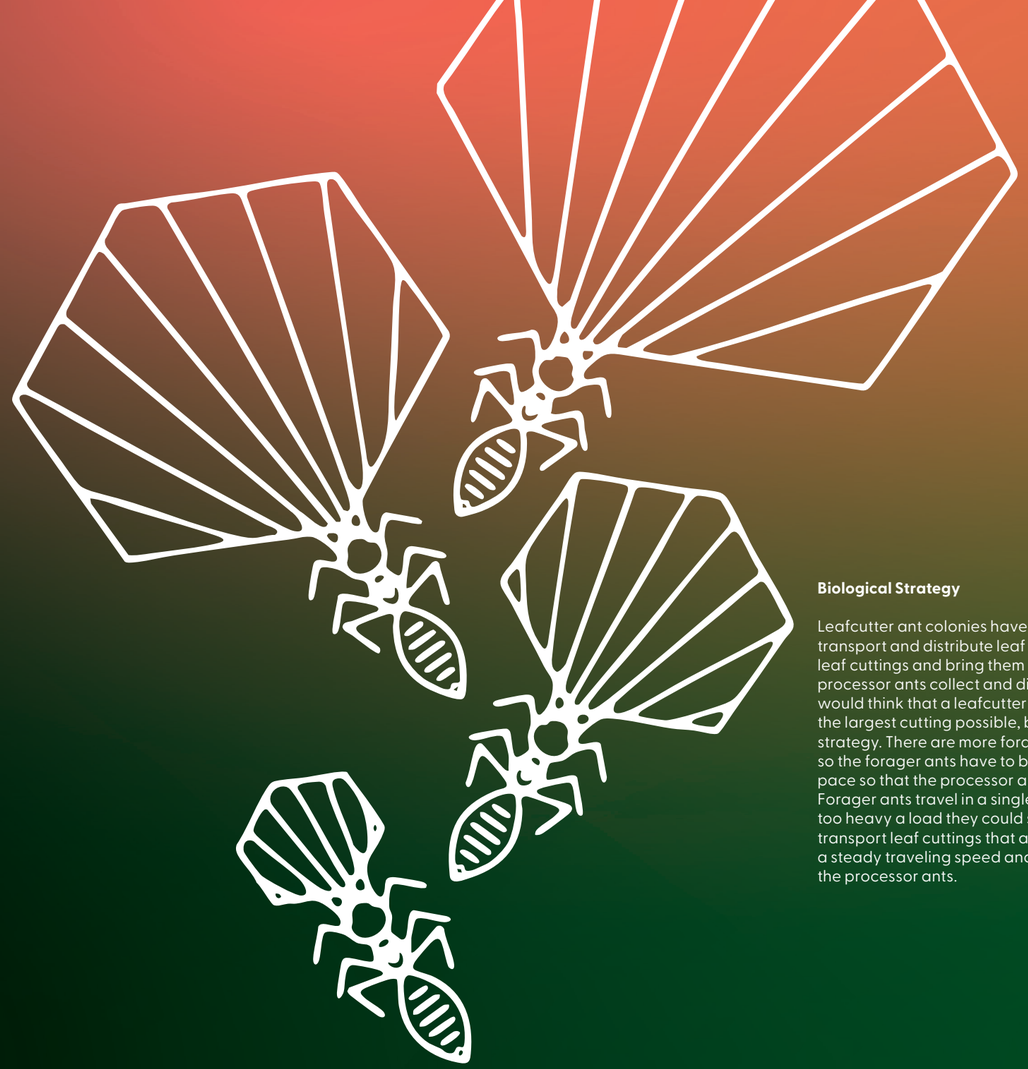
Students will be able to manage visual, physical, and digital assets for the purpose of resource sustainability. They will assess and utilize methods for sustainable ink and paper usage, digital carbon footprint measurement, and can justify design solutions based on economy of use and impact.

Economy is perhaps the easiest mindset for design educators and students to adopt. Being mindful of our paper and ink usage, our recycling habits, and our energy use is already becoming second nature for many of us. However, economy extends to our digital world as well–more so now with the prevalence of generative AI embedded in our design software. Students should be just as aware of the energy cost of digital design as they are of the material cost of traditional design. More and more carbon calculators are being developed for the creative industry; monitoring a project's footprint should be something that is built into our design processes.

Students can also practice economy by engaging with the production of their designs–whether that means planning a more efficient print sheet, choosing a carbon neutral website host, or requesting materials from regenerative or recycled sources.

"But designing sustainably–I don't think I really do that because it would mean I was very efficient, right? Using the least resources possible. But right now, I take a lot of time to design stuff."

– Design Student, Interview #7



Biological Strategy

Leafcutter ant colonies have a strategy to economically transport and distribute leaf cuttings. Forager ants collect leaf cuttings and bring them back to the colony, where processor ants collect and distribute the cuttings.[45] You would think that a leafcutter ant would want to bring back the largest cutting possible, but the ants have an efficient strategy. There are more forager ants than processor ants, so the forager ants have to bring leaves back at a steady pace so that the processor ants don't get overwhelmed. Forager ants travel in a single-file line; if one ant is carrying too heavy a load they could slow the entire line. The ants transport leaf cuttings that are the optimum size to maintain a steady traveling speed and a reasonable workload for the processor ants.

[45] "Foragers Respond to the Speed and Efficiency of Other Ants – Biological Strategy – AskNature."

Engagement with Policy

Students will recognize relationships between design and policy, and advocate for and support environmental and climate policy through design. They will assess how their design practice can align with civic, cultural, and environmental climate goals.

Designers don't often engage with the policy affecting their design process–whether that's campus policy, corporate policy, or governmental policy. Many businesses[46] and organizations[47] are aligning their goals and policy with the UN's 17 Sustainable Development Goals, or SDGs. The SDGs "recognize that ending poverty and other deprivations must go hand-in-hand with strategies that improve health and education, reduce inequality, and spur economic growth – all while tackling climate change and working to preserve our oceans and forests."[48] Students in visual communication can align the goals of their projects or design practices with the SDGs that feel most crucial to their vision of the future. Visible alignment with SDGs and other climate policy can attract support and funding from those wishing to build a climate resilient future.

"When business executives, collaborators, and legislators fail to value sustainability, designers must use communication and leadership skills to convince them."

– "Sustainability in the Future of Design Education", page 160

"So policymakers, we can influence policymakers. However, very few of us become policymakers."

– Design Professor, Interview #24

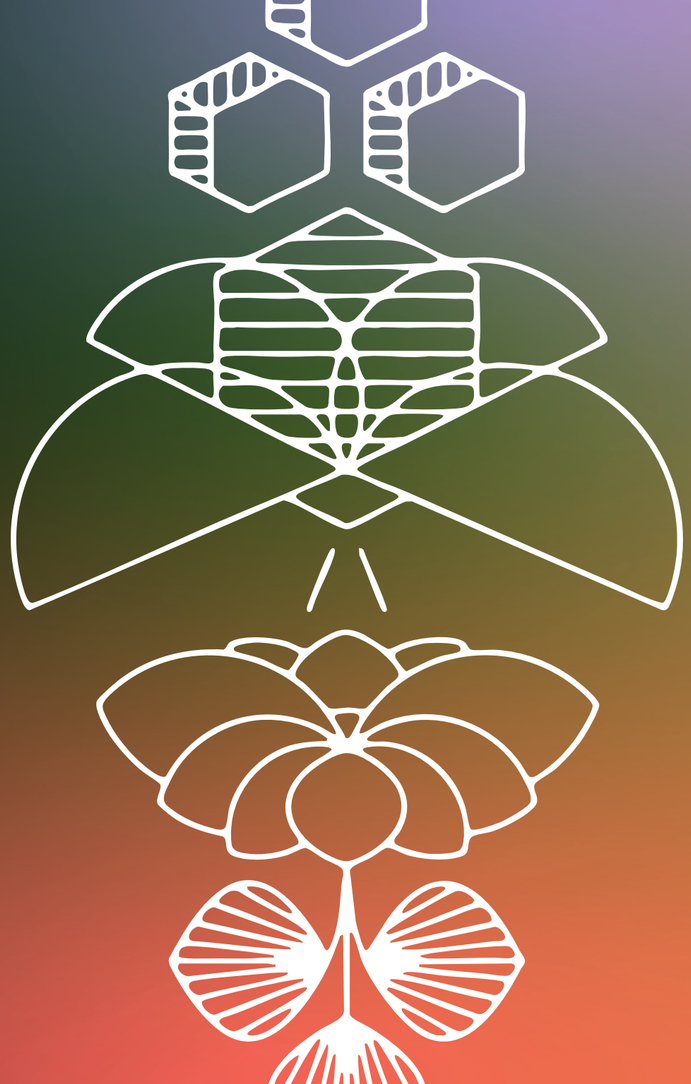
[46] Nike.com, "Nike Sustainability. Move to Zero."

Nike's sustainability commitment works to align their business with SDG 12: Responsible Consumption and Production.

[47] Oceana, "Oceana X Discovery Shark Week."

Discovery's Shark Week donates to Oceana to support SDG 14: Life Below Water.

[48] United Nations, "The 17 Goals | Sustainable Development."



"At the end of the day, there's so much that rides on policy. And this is where designers are very often completely in the dark, at least coming out of design school."

– Design Professor, Interview #22

Biological Strategy

When a beehive has reached its capacity, it becomes necessary for some members of the hive to relocate. Rather than just sending bees away, scout bees leave their home hive to search for a suitable second location. When a scout finds a nice spot, he returns to the hive and uses a complicated dance to communicate the location and desirability of the potential new hive. Interested bees fly out and gather to assess the proposed site. When the number of bees gathered at a location reaches about 15, the group heads back to the main hive to announce that they've decided on a new location.[39] Honeybees engage with new hive policy to vote by quorum on a site for a second hive.

[49] AskNature, "Quorum Determines New Hive Site – Biological Strategy – AskNature."

Honesty & Optimism

"The most powerful critique of a bad solution is a better one. The task of design is to generate those better solutions, and that must begin with optimism–the belief that a better solution is possible."

– Bruce Mau in *MC24*, page 81

Students will practice identifying and avoiding instances of bias, dishonest marketing strategies, and unethical design practices. They develop the ability to identify opportunities for positive change, and reflect on design's ability to innovatively shape culture and environment.

Students I interviewed were quick to note instances of bias and greenwashing as examples of failed design. In a country where the right to free speech is being under attack by banning mere *words*[50] that suggest diversity, equity, and inclusion in our policy, it's more important than ever that designers be acutely aware of the messages they are promoting and biases they may possess. The climate crisis will be worse for those that are traditionally economically, sociologically, and systematically oppressed. Design culture can play an important role in how we respond to instances of silencing and oppression by bringing attention to truth and bias.

Additionally, there is research out there that points to optimism as a better strategy for climate resilience than the constant dire warnings we are used to. Anne Therese Gennari, author of *The Climate Optimist Handbook*, quotes Tali Sharot[51] in her Masterclass:[52] "The brain triggers a 'go' response to things that we want and desire, and a 'no-go' response to whatever scares us or brings any sort of negative feeling." If we wish to inspire climate resilient mindsets with our design, we can utilize messaging that inspires thoughts of a brighter, resilient future, rather than focusing on frightening statistics and scenarios.

"The fact that corporations are taking advantage of something that is supposed to be enacting actual change and then just using that to make things worse or make them look better... makes me feel betrayed."

– Design Student, Interview #11

Biological Strategy

Nest building is a carefully considered, evolving process. Birds choose nesting sites based on past brood success, weather, predators, and the actions of their bird neighbors.[53] If a brood fails, the mother bird will consider the factors that led to that failure and choose a more appropriate nesting site next season. Birds are honest about their nests' shortcomings and optimistic about raising a successful brood the next season.

And I can think of no natural symbol more optimistic than an egg–a fragile, small shell holding a future generation.

[50] Yourish et al., "These Words Are Disappearing in the New Trump Administration."

Yikes guys.

[51] Sharot is the author of *The Influential Mind*, and Gennari quoted her directly in her Climate Optimist Masterclass.

[52] Gennari, "The Climate Optimist Master Class."

[53] Krupin, "Birds Build Responsively – Biological Strategy – AskNature."

Hyper-Localization

"Sustainability will not come primarily from homogenized top-down approaches but from the careful adaptation of people to particular places."

– David W. Orr in *Ecological Literacy*, page 33

Students understand that the biggest impact they can make in climate resilience is in their immediate community, and are familiar with the local environment, culture, indigenous practices, waste management, and supply chain. Living sustainably during climate change will require adaptations to particular places and ways of being that may not scale or travel well.

The authors of *Sustainism is the New Modernism* note that "Local is a quality, not a geographical marker."[54] What works well in San Francisco won't work as well in Hyderabad. Not for lack of trying–humans have been trying to pin down that cross-cultural special sauce that will help us make something that *everyone* can use for decades. One-size-fits-all solutions aren't going to fix climate change. To be climate *resilient*, we need to consider how our work can bolster our local communities so they can thrive in times of massive change. Designers need to add a local quality to their work–work with local vendors, source local materials, do work for local businesses, build the local economy and infrastructure. Involve local participants and communities in your design process. Like the starling, by paying close attention and care to those in our immediate vicinity, we can influence a larger and larger movement in a desirable direction.

We are all pretty clueless about where our stuff comes from, and where it goes. Buying paper that was manufactured on the other side of the country does nothing for a design project but increase its carbon footprint. Designers are often blissfully unaware of the waste and recycling management practices in their city, and these practices can actually vary widely, to the point where saying something can be recycled really doesn't mean anything unless you know exactly where it's going to be disposed of.

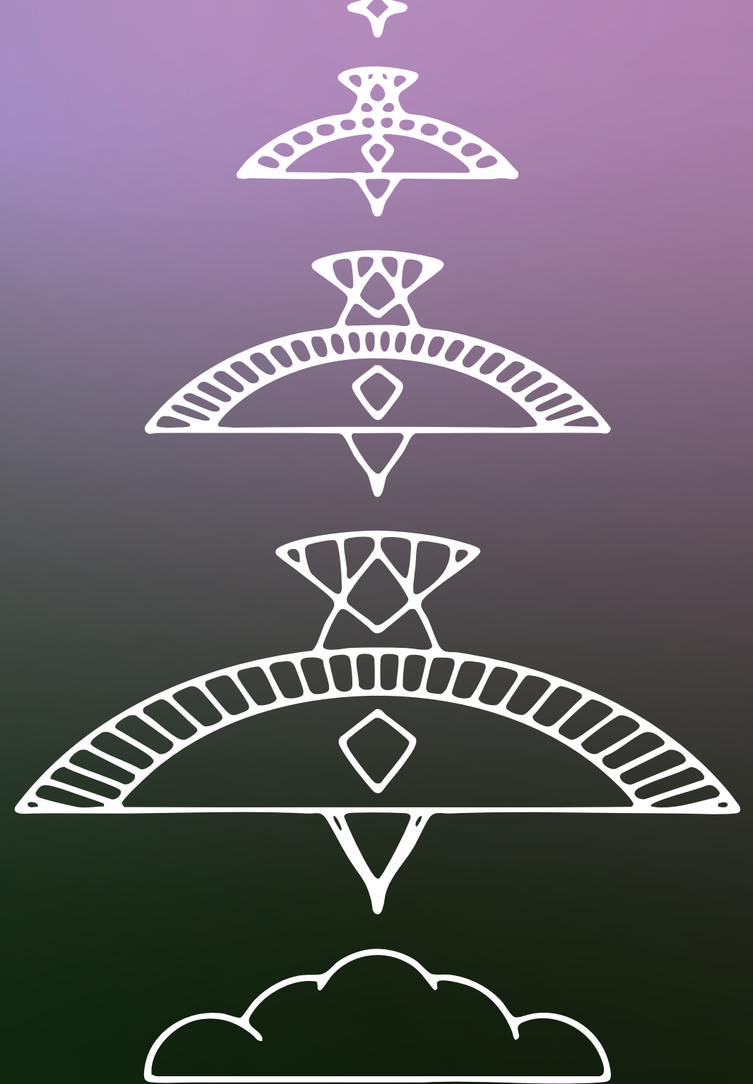
Indigenous practices have all but been erased from America's educational system. Designers who wish to be climate resilient must familiarize themselves with their native locality. How did the indigenous stewards manage the local environment? How can your design practice respect and support those efforts?

"What ethical connection does your work have with the world around you?"

– Design Professor, Interview #21

[54] Schwarz and Elffers, *Sustainism is the New Modernism.*

I really appreciate the way this manifesto streamlined complex ideas around sustainability, but it had no page numbers and that drove me absolutely nuts.



"To work in a regenerative model, you're really responding to the environment of the place, the people in the place, the culture of the place. [How do you] make decisions that are mutually beneficial instead of extractive?"

– Design Professor, Interview #22

Biological Strategy

Every evening, thousands of starlings take to the sky in one huge flock, creating massive, undulating forms called murmurations. The birds race and dive in extremely close proximity–sometimes only inches from each other. Scientists have found that in order for the birds to move so cohesively when presented with the uncertainty of the movements of thousands of other birds, they only need to pay attention to their seven closest neighbors.[55] By limiting their focus to their immediate surroundings, the birds are able to make complicated movements without disrupting their neighbors. This hyper-localization results in beautiful, complex movements with fluidity and coordination.

[55] Stier, "Starlings Coordinate Movements Within a Flock – Biological Strategy – AskNature."

Systems & Transitions

"Unsustainability is already embedded in our systems. So it's going to be hard to work around that."

— Design Student, Interview #12

Students will be able to apply systems thinking and circular design principles to visual communication design, recognizing and embracing the complexity of the interdependent environmental, economic, social, and technical systems their work is a part of. They will make design decisions based on context, explore circular economies as they relate to design, and understand the consequences of the design field on interrelated ecosystems.

In the Summer 2023 issue of *She Ji*, Hugh Dubberly wrote, "Understanding systems is essential when intervening in ecological, economic, and political issues. Understanding systems is also increasingly necessary in designing better products and services. It frames a new approach to design practice that has been emerging for years. And it requires a corresponding shift in design education."[56] Students should be equipped with the basic knowledge of how systems are constructed and how they work. Design students should take a whole systems approach to their work - understanding how their work is a part of a greater whole; their work's relationships, context, lifecycle, and consequences; the network of goals their design goal is a part of; who or what those goals serve; a design's scale; and how the design is related to time and scales of time. Systems thinking is the concept of being able to look at a complex problem and consider the interconnectedness and interdependencies present. It's a way of embracing and acknowledging complexity, rather than just focusing on small parts of a whole. Complex problems usually involve the interconnectedness of many systems, large and small. Understanding where we–and our designs–fit into these systems is crucial if we are to design in a climate resilient manner. Transition design takes the concept of systems thinking one step further. It looks at large problems and identifies areas where small interventions can help create change in those systems to move us towards more desirable futures.

We can think of our current economy as one of "take-make-waste." We take from the environment to make something, and then we throw it away. This is unsustainable. The Ellen MacArthur Foundation defines a circular economy as "a system where materials never become waste and nature is regenerated. In a circular economy, products and materials are kept in circulation through processes like maintenance, reuse, refurbishment, remanufacture, recycling, and composting. The circular economy tackles climate change and other global challenges, like biodiversity loss, waste, and pollution, by decoupling economic activity from the consumption of finite resources."[57] A circular design practice is designing to support a circular economy. More and more companies are exploring this method of production and regeneration, as it's becoming abundantly clear that our resources are not infinite. Design students savvy in the language and processes of systems thinking and circular design would fare well at any business that is working to build climate resilience.

[56] Dubberly and Pangaro, "How Might We Help Designers Understand Systems?" 135-156.

[57] Ellen MacArthur Foundation. "Introduction to circular design."

"We no longer are doing just chairs, logos, posters, dresses, and packaging. Instead, we are developing experiences, platforms, services, organizations, and communities, often on a global scale."

— Manuel Lima in *The New Designer*, page 34

Biological Strategy

Mycorrhizal fungi, small threads of mycelium that make up a vast underground network, live in a mutualistic partnership with trees and other plants.[58] Mycelium acts as a network between trees, plants, and other fungi, sending water, chemicals, and signals throughout the forest. If a larger tree has an oversupply of nutrients, mycelium shuttles the extra to other trees and plants that may have a deficiency. If a tree is being attacked by a pest, it can send out a warning through the mycelial network, allowing other trees to bolster their defenses. These networks help forests function by optimizing resource sharing to benefit the whole ecosystem.

[58] Ritter, "Underground Network Distributes Resources – Biological Strategy – AskNature."

Trans-Disciplinary

"One way to explore the limits of modesty is to learn how to partner with nondesigners, not just working in separate roles with each doing their own thing but inviting nondesigners to be involved in the creative process. Codesigning with others can be a truly humbling experience."

– Manuel Lima in *The New Designer*, page 38

Students of design collaborate and communicate across disciplines and practices, integrating innovative scientific, environmental, and sociological research and diverse perspectives into their design processes. They will approach complex challenges with a multidisciplinary mindset, leveraging methodologies such as co-design and participatory design to co-create impactful and sustainable visual communication solutions.

As the Things we design become more complex to meet the needs of a world that is increasingly interconnected, designers need to enter the workforce comfortable with interdisciplinary work. Building climate resilience means intervening in complex, interconnected systems and disentangling the complex, interconnected problems that plague those systems. Designers who choose to work on climate will need to collaborate with those in environmental science, engineering, and biology. Designers who wish to build a climate resilient practice will need to be comfortable reading and effectively communicating the research of those in other disciplines. By framing visual communications design as one part of many disciplines that can be recruited to build climate resilience, we are giving designers agency and credibility in the building of better futures.

Encouraging design students to utilize participatory and co-design strategies for every project they are a part of encourages the mindset of trans-disciplinarity. Even something as small as surveying the target audience of a poster assignment sets the stage for more effective collaboration and more valuable messaging. The myth of the sole genius creative is outdated, inaccurate, and frankly dangerous in a time when our biggest problems can only be solved by working together.

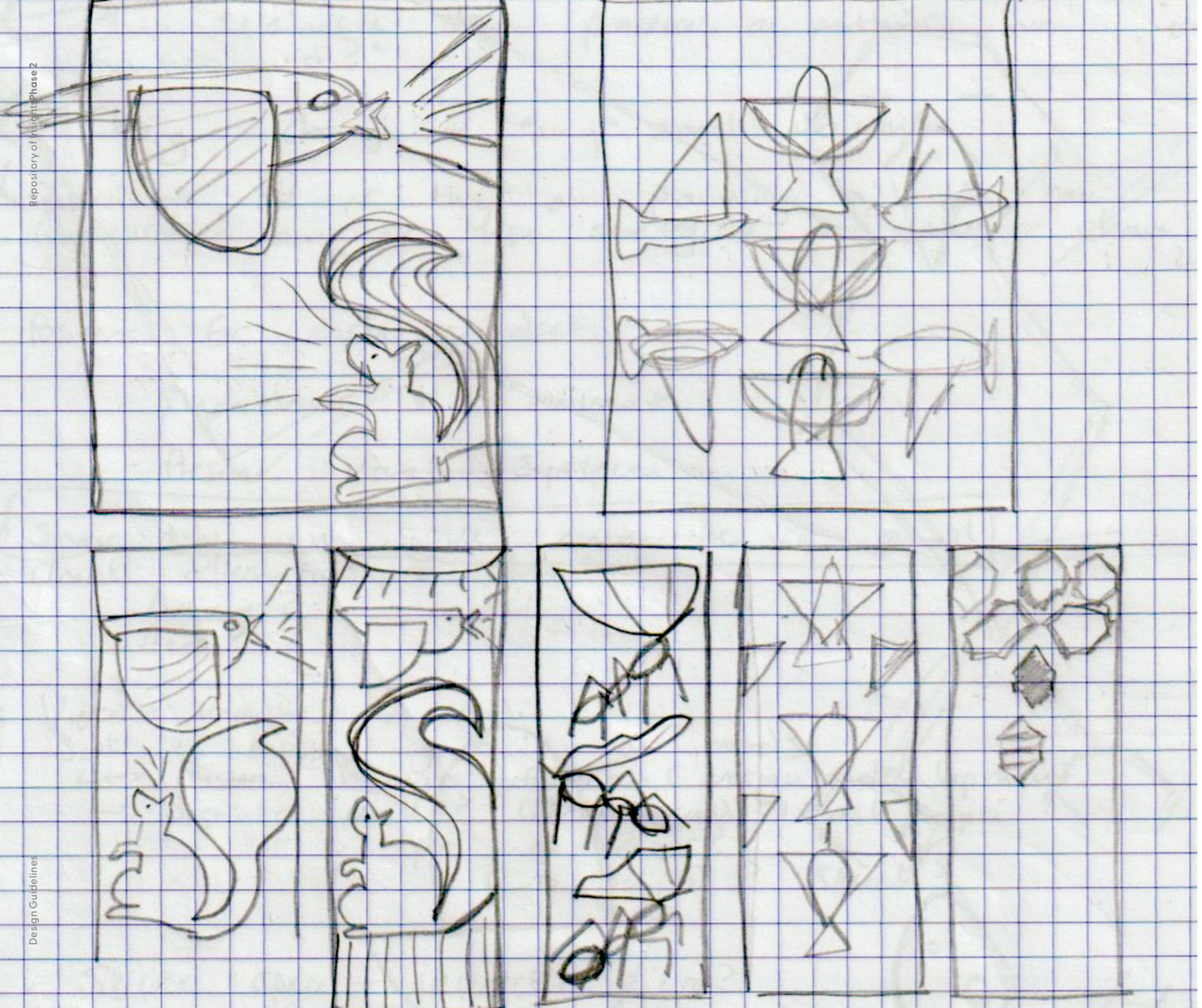
"I firmly believe in connection with other disciplines. I think design is almost like a tool that is part of this broader toolkit, which is all of these great minds and all of these different people communicating and thinking together about how to solve these really large scale problems."

– Design Professor, Interview #23

Biological Strategy

Black-capped chickadees use a warning call–it sounds like "seet"–to warn other chickadees of a predator in the area. The warning call is so high-pitched and faint that predators, such as owls or hawks, can't hear it. Chickadees who make this call are giving their fellows an effective advance warning. Other species, including nuthatches, jays, squirrels, and chipmunks also recognize this warning call and will take cover when they hear it.[60] By utilizing this transdisciplinary warning system, these small animals can spend more of their precious time foraging and less time on alert for predators.

[60] Ritter, "Alerts Provide an Early Warning System – Biological Strategy – AskNature."



Left: Exploratory sketches mapping biological strategies onto mindsets, while maintaining adherence to a strict grid.

TARGET AUDIENCE

My target audience is **educators of visual communication or graphic design who teach at the postsecondary level**.

I am aware that many of the shifts and mindsets could apply to other design disciplines, such as industrial, interactive, interior, environmental, and service. These mindsets could also enhance design thinking, a method of creative problem solving frequently taught to leaders in engineering and business. I chose visual communication design because I feel as though the discipline has entered an era of change.

For quite a while now, visual communication has not been limited to the printed word and image. Visual communication takes place in books and on paper, in digital applications and web pages, in augmented and virtual and actual realities. These are the places where ideas are spread. For too long we've thought that designing for environmental sustainability was the concern of the physical realm, and so industrial design has a fairly robust sustainable pedagogy. However, climate resilience–thriving in the face of tumultuous change–deals in intangibles. It deals in energy and equity and locality. It intervenes in ecosystems and ethics and status quos. It's these intangibles, the backbones of design culture, that visual communication embodies. Yes, visual messaging is powerful; embodying climate resilient mindsets in our visual communication design practices is what will shift design culture towards one of resilience.

And I believe that shift needs to start happening at the collegiate level. Students should enter the workforce with these mindsets, embedding themselves and their mindsets into our visual culture, encouraging those they work for to embrace and embody these mindsets themselves.

DESIGN GUIDELINES

In the practice of design research, we use insights and pain points from our interviewees to develop design guidelines for the finished product. These guidelines are requirements that are to be met for a design to be considered successful. Insights from my interviews with educators and my research into design pedagogy helped me identify critical gaps in current climate resilient design education. Addressing the gaps through a practical framework that follows the guidelines outlined below will help make a crucial pedagogical shift toward sustainability and transdisciplinary thinking.

These guidelines were developed to guide my thesis project ideation at a time when I was constantly waffling between potential project outcomes. Prior to creating them, I did not know the final form my project would take. I considered everything from an in-person co-design workshop to a book to a set of principles. Some guidelines I had originally considered but ended up putting on the back burner include durability, modularity, circularity, impactful, and marketable. I won't abandon these guidelines altogether, but I was able to narrow them down to the four most critical. I've learned that it can be cumbersome and challenging to introduce new projects and pedagogy into a course, so in order to make a project that is useful to design professors, I needed to make sure it follows these four guidelines.

My thesis project had to be:

Adaptable

The solution must be adaptable to different courses and assignments. Visual Communication professors teach a variety of concepts, from typography to web design to history. The solution should be easily adapted to these different topics. It's important that it can also be adapted to more than one single project, not just for the purpose of adaptability within the professor's course load, but being able to use the solution across different projects means the concept can be reinforced through repetition.

"I love this idea of resources and collective toolkits around a certain topic, or some website where any educator can look at it and say like, 'this is the toolkit for this' and 'this is the toolkit for that."

– Design Professor, Interview #23

"So maybe your project is actually about asking the right questions, and what needs to be questioned, rather than telling people what the answer is, because I think that's... you're not going to forget that."

– Design Professor, Interview #16

Scalable

The Solution can be implemented at fundamental levels and scale with skill level or student advancement. It's important for the solution to work at all levels of postsecondary coursework. A solution that is only applicable to upper-level, or even graduate-level coursework, risks being relegated to an elective and does not solve the problem of climate resilient design being sidelined due to complexity.

"[Sustainability] needs to just be part of how we approach design to begin with."

– Design Professional, Interview #1

"I like to call this like forever knowledge: what things can we give them that they can't get anywhere else that will last through their lifetime, like the design process, how to take critique, what is good visual form. What things can they get elsewhere as they continue a lifetime of learning?"

– Design Professor, Interview #15

Integral

The Solution must easily integrate into the professor's existing methods for course design and evaluation. Professor's do not have a lot of time or motivation to research, develop, and implement a brand new project or module. Often the coursework being taught has been refined over the course of many years, and changing it requires bureaucratic maneuvering. It is much easier for professors to consider small changes that can be seamlessly woven into their assignments, exercises, and pedagogy.

"And it mirrors corporate America where you have that sustainability department. And it's like, why are we treating this as a checkbox? Why shouldn't this be integrated in all of the design schools, all of the companies?"

– Professional Designer, Interview #9

"All of our colleagues are like, 'yes, we also care about sustainability,' but it's not in anyone else's classes. Nobody's not doing it because they are against it, but there is this idea that it's too hard to implement."

– Design Professor, Interview #21

Practical

The Solution has to help teach skills that can be assessed and prepare students for future design careers. The solution must be written in such a way that educators can easily assess whether the students have achieved learning objectives that pertain to climate resilient design mindsets. A case should be made that in meeting these learning objectives, students are learning skills that will make them more valuable in the workforce.

"I do feel like if you're telling this stuff to students, you don't know where they're going to end up working or what thing they're going to end up doing. So it may not end up being relevant."

– Design Professor, Interview #18

"What we're thinking about first is, what do our students need to be prepared contributors in a professional and global setting."

– Design Professor, Interview #16

Phase 3

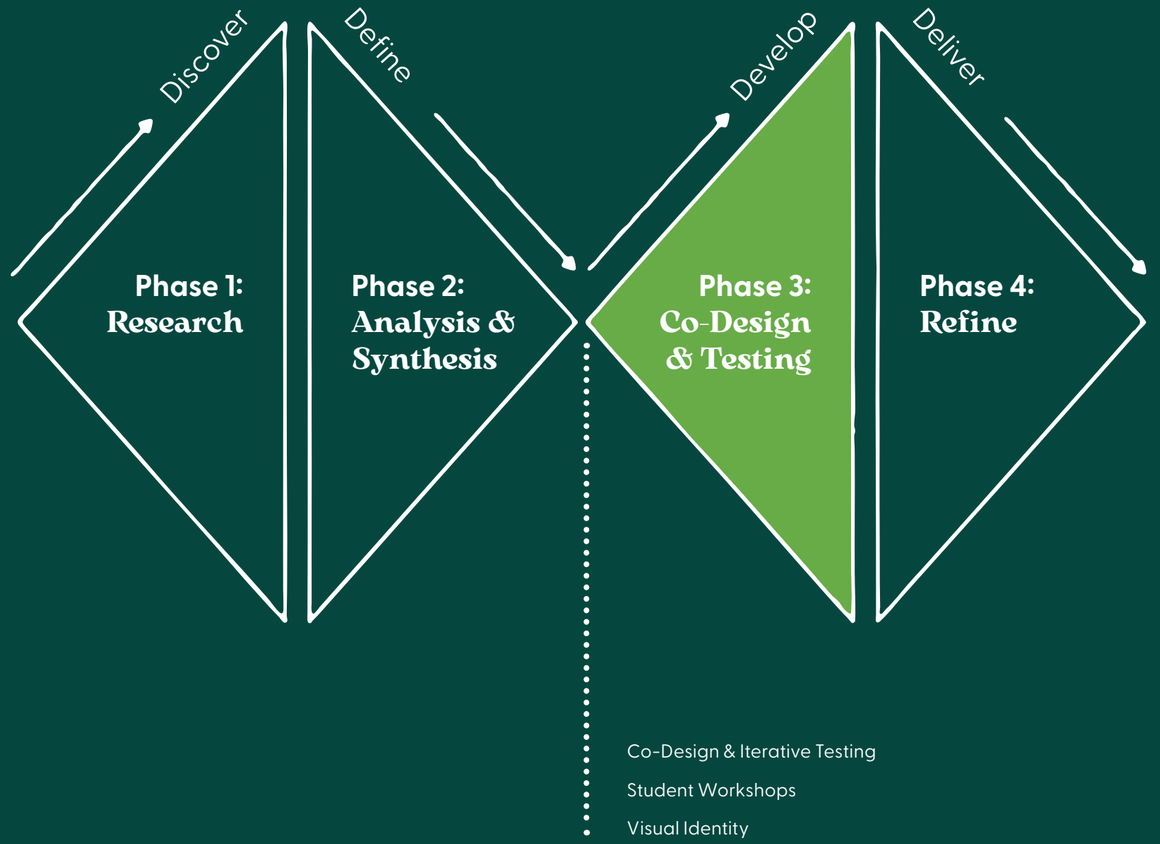
Co-Design Activities

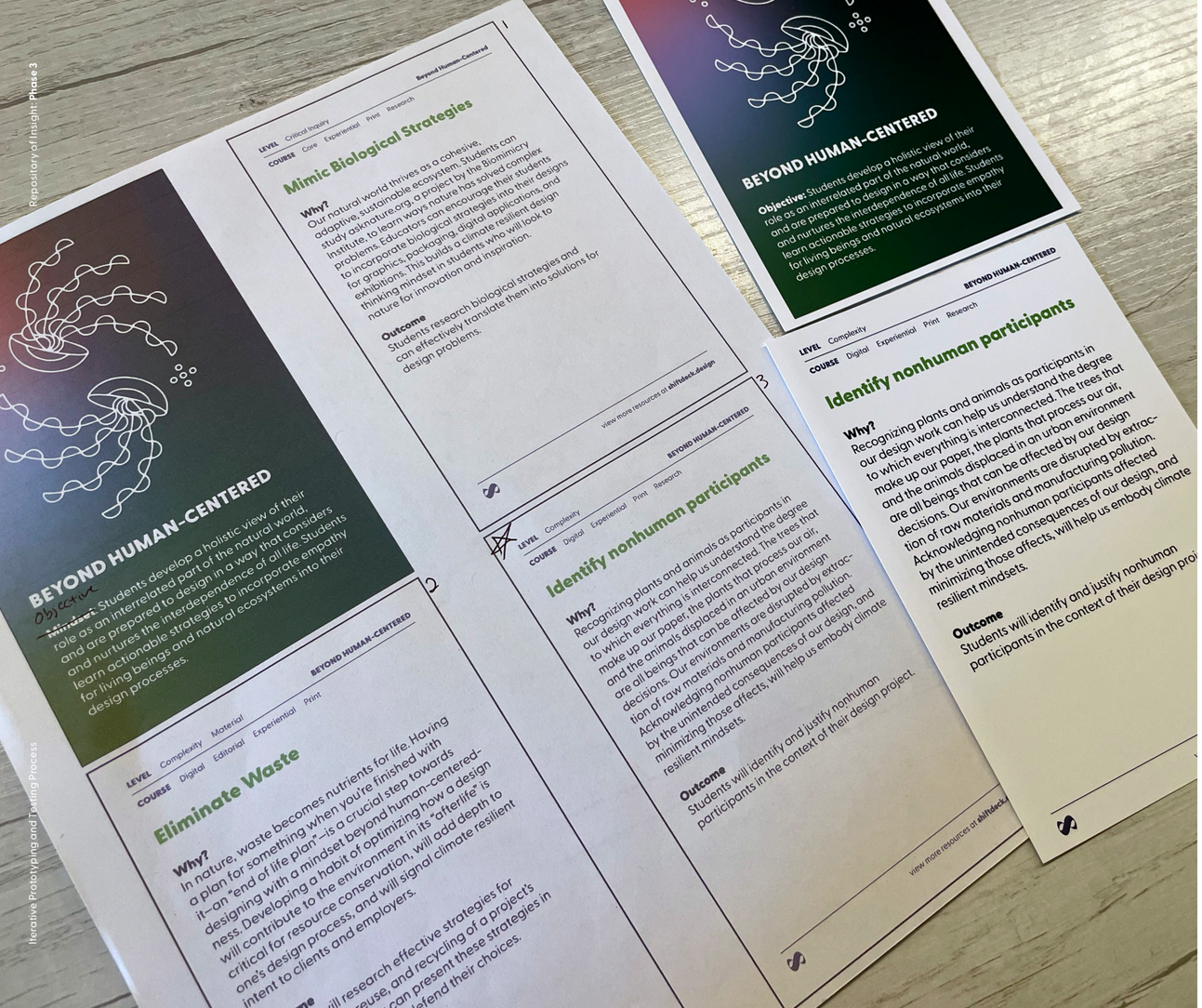
Iterative prototyping and testing, student workshops

PHASE 3: CO-DESIGN ACTIVITIES

In phase three, The Shift Deck was refined through an interactive prototyping process, including a co-design activity with ten visual communication design educators and two in-class workshops with students. With continued refinement and co-design, these shifts have the potential to cultivate a generation of designers whose work is creative, thoughtful, and resilient.

These are two early examples of the Shift Deck instruction booklet's design.





ITERATIVE PROTOTYPING AND TESTING PROCESS

The evolution of the Shift Deck

My biggest observation from this research is that all of this information is out there. There are so many books in the realm of climate resilient design. Online courses, ebooks, and guides are plentiful.

Professors still aren't 100% sure how they can incorporate these ideas into their pedagogy. For whatever reason, they aren't getting what is out there. Or, they're getting it, but they can't make the connection to their teaching practices, or don't have the time to. Or they feel as if they are unqualified to teach climate resilient methods because they aren't climate scientists.

My research points to the necessity of a solution that is tailored for those who teach. Educators could take a course in any sustainable methodology, but that won't help them integrate the information into their specific design pedagogies. I was inspired by the IDEO Methods Deck, and how it offered succinct research methodologies in the format of bite-sized, actionable steps that can be integrated into any research project. Presenting climate-resilient methodologies as small, actionable interventions that enhance and complement student projects and educator's assessment process could give both students and educators hope about the contribution of their work towards a better future.

Why a Deck?

A deck of cards says "I'm small, portable, and endlessly useful." Each Shift, even though it is backed by decades of research, is small enough to fit on one of these cards.

A deck meets a few of my design guidelines: a deck of cards is *practical*–you can easily bring it with you and share it. Each card is a succinct, quick read. A deck is *adaptable*: you can set aside cards that don't serve your current course load. You can easily share a card or two with a colleague. Decks allow you to carry the cards you might need with you, and leave the ones you don't need at home. They allow you to look at multiple ideas at once, without needing to flip through pages or use bookmarks. You can shuffle them, share them, stash them in a bag, and build a house of cards with them.

A belief that small changes can make a big difference

While I alone cannot fully overhaul an entire design curriculum and its context within a capitalist system, this deck can be considered my own small piece of transition design–my small intervention into a larger system. The mindsets and learning outcomes I've designed help postsecondary design educators prepare undergraduate visual communication design students to integrate practical strategies for climate resilience into their professional practice.

The Shift deck is a series of small, practical strategies for climate resilience. Each card describes a Shift: something a student can do or learn within the context of an existing design project or assignment that will support climate resilience. The card also describes how the shift contributes to climate resilience, and lists a learning outcome that describes how students will demonstrate these new competencies and how they may be assessed. Each shift is aligned with one of the 5 Levels of Sustainability Pedagogy to help educators discern the level of engagement with sustainable methodology the shift provides. To be sure that this deck is useful to both my target audience and the students they teach, I completed a few rounds of iterative prototyping with professors and in-person workshops with students at San José State University.

The feedback I've received during this stage is promising. These small shifts are opening professor's eyes to the idea that small additions to their curriculum can contribute to climate resilient mindsets without adding entirely new assignments, and students recognize these shifts as valuable actions towards positive change that they can actively include in their evolving design practices. As I continue to develop the deck in the future, I would love to get the opinions of professors who feel less inclined to teach sustainable and climate resilient concepts, as those are the members of my target audience I would most like to reach.

Left: A Shift Deck prototype used during a classroom workshop with junior-level BFA Graphic Design students.

Reposition Amulet, Phase 3

Student Workshop, March 27, 2025

Phase 3

Student Workshop

DSID 122: CRITICAL AND CONTEXTUAL STUDIES, TAUGHT BY MARA HOLT SKOV, SAN JOSÉ STATE UNIVERSITY

MARCH 27, 2025

Research Questions

How do students of design implement these shifts into their coursework? Are the shifts clear and concise enough for student comprehension? What kinds of questions do students have about implementation? Do they find this work to be compelling, necessary, and timely?

Participants

Students in DSID 122: Critical and Contextual Studies, Spring 2025, taught by Mara Holt Skov, San José State University

Methodology

I presented my research to students during the class module on sustainability in design. These students are industrial designers, but their professor and I felt it would be beneficial to introduce them to my work at this time. This presentation served as an introduction to the MDes program at SJSU, the research required of master's level students, and the Shift Deck. I explained the seven mindsets, and the biological strategy that inspired the graphics for each mindset. Then I introduced students to two shifts: *Sustainable Development Goals* and *Identifying Tertiary (and beyond) Stakeholders*.

The class had recently completed a poster project that featured the functionality and user experience of one of their industrial design projects. I asked each student to choose one of the two mindsets that they were most comfortable exploring in relation to that project, and to complete the writing prompt provided. The students had about 25 minutes to work on a shared Google Doc to complete the writing prompt.

Key Findings

This was the first time I had the chance to test any shifts with design students. Students were very receptive to the mindsets and shifts, but had some key struggles with implementation. This could be remedied with more time, or more precise language, or smaller shifts.

- My presentation was a little long. I can make an effort to condense it down to what students need to know to complete the activity.
- Students who chose the shift, "Identify Tertiary Participants" tended to either identify all human tertiary participants, or all animal tertiary participants. No students really went so far as to consider participants from the plant kingdom.
- Some students felt as if they were "cheating" because their product was already very sustainable. I reminded them that being able to articulate why their product is sustainable or climate resilient in terms of real world climate goals and user needs adds necessary depth and research to their portfolios.
- Many students readily made connections between their tertiary users and ways their product–or the system their product functions within–could better benefit them.
- In the future I would like more time to work with students as they explore how the shift can be applied to their work. Twenty minutes was not quite enough time, but I'm pleased with how engaged everyone was in that short period.

Synthesis

- I separated the Shift, "Identify Tertiary Participants" into two new, separate shifts. Asking students to consider all human, plant, animal, technological, and environmental participants in one shift seemed overwhelming to most.
  - "Identify Nonhuman Participants" is a new Shift that asks students to identify participants that are not human, such as plants and animals. This shift is in the Beyond Human-Centered mindset.
  - "Identify Tertiary Participants" is a new Shift that asks students to look beyond primary and secondary stakeholders to the humans involved in the creation, processing, and recycling of materials and processes related to their design. This Shift is now in the Trans-Disciplinary mindset, which makes more sense now that I have reworked these two mindsets.
- I have reduced the length of my presentation for future workshops by condensing each mindset to bullet points instead of paragraphs.
- I would prefer to have students work on a Miro board or a FigJam in the future, if it makes sense for the class and everyone has access.

Left: Me, mid-presentation for my first Student Workshop.

Right: A mockup of the sample Shifts I used for this student workshop.

SHIFTS AND INSTRUCTIONS AS THEY WERE PRESENTED TO STUDENTS

Systems & Transitions

Sustainable Development Goals

Why: Governmental bodies (some of them) are making pledges to support initiatives of sustainability and climate resilience. Being ignorant of these goals is not in a designer's best interest, especially as more and more companies and cities are aligning their environmental policy with the UN's Sustainable Development Goals. Besides being noble goals for a healthy planet, the SDGs are rich sources of environmental data.

Aligning design projects with the SDGs help students become aware of global goals for climate resilience, and begin to see their own practice as one that can support these goals.

Outcome: Students analyze the UN's Sustainable Development Goals, and determine how their design practice can help impact them in a positive way.

LEVEL 1 2 3 4 **5** | UI | EX | PACK

Resources: Explore https://sdgs.un.org/goals. Go deeper into the data by viewing each goal's targets and indicators.

Write: Using your most recent functionality and user experience poster project as an example, consider: *Which of the 17 SDGs do you feel your project most aligns with? Why?*

If it doesn't align with them, how could your project's materials, processes, or use help support the UN's SDGs?

Beyond Human-Centered

Identifying Tertiary Stakeholders

Why: Recognizing the true participants and actants in our work can help us understand the degree to which everything is interconnected. Recognizing plants and animals as participants is probably the least-complex stakeholder group to start with. Students could also think about technologies as participants, such as AI technologies, or considering human laborers as participants in a design. The plants that make up our paper, the people that collect our garbage, and the animals displaced in an urban environment are all affected by design. Our environments are disrupted by extraction of raw materials and manufacturing pollution. Identifying stakeholders affected by the unintended consequences of our design will help us design with more climate resilient mindsets.

Outcome: Students will identify and justify tertiary stakeholders in the context of their design project.

LEVEL 1 2 3 **4** 5 | UI | EX | PACK

Write: Consider "who" to refer to plants, animals, people, environments, and even technology. Using your most recent functionality and user experience poster project as an example, consider: *Who makes it? Who sells it? Who ships it? Who buys it? Who breathes/eats/touches/ingests it? Who profits from it? Who disposes of it? Who processes the waste materials?*

What changes could you make to your product so its effect on these tertiary stakeholders is minimal or beneficial?

UPDATES TO "IDENTIFYING TERTIARY STAKEHOLDERS" SHIFT

LEVEL Complexity — **BEYOND HUMAN-CENTERED**

COURSE Digital Experiential Print Research

Identify nonhuman participants

Why?
Recognizing plants and animals as participants in our design work can help us understand the degree to which everything is interconnected. The trees that make up our paper, the plants that process our air, and the animals displaced in an urban environment are all beings that can be affected by our design decisions. Our environments are disrupted by extraction of raw materials and manufacturing pollution. Acknowledging nonhuman participants affected by the unintended consequences of our design, and minimizing those affects, will help us embody climate resilient mindsets.

Outcome
Students will identify and justify nonhuman participants in the context of their design project.

view more resources at **shiftdeck.design**

LEVEL Critical Inquiry — **TRANS-DISCIPLINARY**

COURSE Digital Editorial Experiential Research

Identify tertiary participants

Why?
Students look beyond primary and secondary users and stakeholders to consider all human participants in a design, identifying participants as people who inhabit the communities and support the supply chain within the context of a design. Students understand the human labor and exploitation necessary to extract resources and create material as an unintended consequence of design. Broadening our definition of "participant" to include these overlooked populations will be a large step towards building climate resilient methods into design culture.

Outcome
Students will identify and justify tertiary human participants in the context of their design project.

view more resources at **shiftdeck.design**

It may have been to much, in one Shift, to ask students to consider all human, animal, and plant participants in a design. This also necessitated a seperation into different mindsets, levels, and courses, which made a lot more sense.

Left: The two cards chosen for this workshop, in a layout and color scheme I eventually abandoned. Below each card is the writing prompt provided to students.

Right: The biggest change to come out of this workshop was to split the Shift "Identifying Tertiary Stakeholders" into two separate Shifts: "Identify nonhuman participants" and "Identify tertiary participants."

Phase 3

Web-Based Prototype Testing

POSTSECONDARY VISUAL COMMUNICATION DESIGN EDUCATORS
FEBRUARY–MARCH 2025

Research Questions

Do visual communication design educators find this information useful? Is this something that they would use in their classrooms? Do they find the deck of cards format easy to use?

Participants

Ten visual communication design educators from locations throughout the United States.

Methodology

Participants were asked to complete an opening questionnaire before viewing the sample deck. They were asked to give themselves ample time to review the deck, and then complete a closing questionnaire when they were satisfied with their review of the deck.

- **Opening Questionnaire**
  This questionnaire introduced my project, gathered data about professor's familiarity with topics of sustainability and climate resilience, and gauged the importance of climate resilient design in their current pedagogy and the likelihood that they might see small pedagogical shifts as valuable to climate resilient practices in their classrooms.
  - **Technology**: Created and distributed with Google Forms.
  - **Analysis**: Executed a statistical analysis of the information collected.

- **Low-fidelity web-based Shift Deck prototype**
  The prototype presented 12 of the most developed Shifts from my deck. The experience mimicked the deck; each digital card could be "flipped over" when clicked, so users could view the mindset printed on the back that corresponded with the Shift printed on the front. Below the cards, I included descriptive text for each of the seven mindsets and 5 levels of sustainability pedagogy. If testers wished to view more cards, they had the option to view the remaining five that I chose not to include on my main page.
  - **Technology**: Web-based interface, hosted on my own server.

- **Closing Questionnaire**
  The closing questionnaire looked to measure a change in perspective after testers viewed the deck and understood its use. I wanted to know which cards felt more actionable than others, and whether they felt like this was something they could use in their own course planning process.
  - **Technology**: Created and distributed with Google Forms.
  - **Analysis**: Executed a statistical and content analysis of the data collected.

Key Findings

Overall the reception from this first round of testing was very positive. I received feedback that I felt was crucial to making the use of this deck a positive experience, and suggestions for broadening the deck's ecosystem such that educators could have access to a forum where they could share successes, failures, and suggestions for the deck's use in their classrooms.

- The 3 cards for the Economy mindset felt a little too similar to some users
- The language around the term "levels" needs to be clarified, with regards to the 5 Levels of Sustainability in Design Pedagogy. Testers weren't sure if the level referred to the level of the student, or if higher level cards were for higher level courses.
- At the time of testing, the mindset of Trans-Disciplinary was titled "Interdisciplinarity." I learned that multidisciplinary, interdisciplinary, and transdisciplinary all mean different ways of working across, and with, different disciplines and professions.
- Many testers would like specific guidelines for applicable courses on each Shift.
- Regarding the Engagement with Policy mindset, I need to be clearer about what is policy, and what is not considered policy. For example, the UN's 17 SDGs are goals for sustainable development that can be used to influence policy.
- Avoid using the term "nonhuman" to describe participants such as laborers.
- Build a community where educators can share successes/failures/tweaks to the deck
- The Beyond Human-Centered mindset's shifts could be more aligned with how to use nature as a teacher, and encouraging students to engage with local ecology.
- How can this deck become a system that design educators can implement in a more ordered and intentional manner?

Synthesis

I completed an overhaul of the deck's verbiage after this testing phase. I worked to create Shifts that felt very distinct from each other, scrubbed the use of the term "nonhuman," unless I was referring specifically to not-humans, and rewrote some of the mindset objectives.

I decided to rename the Interdisciplinarity mindset to Trans-Disciplinary. Interdisciplinary implies working with multiple academic disciplines in a common framework for

Left: A mockup of the web-based prototype used for phase 3 testing with visual communication design educators, hosted at cindyras.com.

a solution, while transdisciplinary implies working not just across academic disciplines, but with participants and stakeholders outside of academia. This necessary change meant that some of the Shifts that were originally included in the Beyond Human-Centered mindset would move to the Trans-Disciplinary mindset, because they concerned considering plants, animals, and ecosystems as participants and stakeholders in a design project. I also reworked the Shifts in the Engagement with Policy mindset, to clarify the relationship between codified goals and policy.

This is the point in my research where I chose to rework how I presented the **5 Levels of Sustainability in Design Pedagogy**. At this point in time, each level was assigned a number, one through five. I feel that this is a critical bit of feedback, as I was aware that levels 1 and 2 are just as appropriate in upper-level coursework as they are in lower-level, and levels 3, 4 and 5 are pedagogical approaches that would be appropriate for lower-level coursework, but this was not getting through to participants in my explanations. Based on feedback and some confusion around the meaning of the levels, I chose to label the levels instead:

- Level 1: Sustainability as Passive Content » **Content**
- Level 2: Sustainability as Message » **Message**
- Level 3: Sustainability Material Concern » **Material**
- Level 4: Sustainability as a Lens for Understanding Complexity » **Complexity**
- Level 5: Sustainability as Critical Inquiry » **Critical inquiry**

While removing the numbers seems like a simple solution, I feel this sends a crucial message that the levels are not mutually exclusive, nor are they to act as a scaffolding or marker of progress for the shifts.

Lastly, I worked to provide a guide to which courses these Shifts might be most appropriate for. I hesitated to do this initially, because I felt it might lead to less creative implementation. However, I can see how this could prove useful and efficient for those who are new to ideas of climate resilience in their pedagogy, or are new to the deck in general. I created the following labels to help categorize courses each shift would be most useful for:

- **Core**: courses that teach fundamentals of visual communication, such as typography, identity, type and image, digital software courses, data visualization, etc.
- **Editorial**: courses in book, magazine, or publication design
- **Print**: courses in prepress and production, packaging design, and print methods
- **Digital**: Courses in UI/UX, web design, motion graphics, etc.
- **Context**: Courses in design history, contextual studies, or critical issues
- **Experiential**: Courses in designing physical spaces such as environmental, exhibition, experiential, and wayfinding
- **Research**: Courses in design research, human factors, or design thinking.

PROTOTYPE SHIFT

Beyond Human-Centered

Developing Nonhuman Personas

WHY A nonhuman participant could include: people affected indirectly by the design, such as laborers, organizations, and communities; animals, including domesticated, livestock, and wild; and plants, trees, and fungi. When creating a persona for a nonhuman, the process must be based in science and fact. This is different from a typical user persona, which tends to be based on market research. Students have to use sources that are as bias-free as possible and reputable, such as environmental agencies, traditional and indigenous ecological knowledge, and governmental bodies. Understanding the full context of our impact across all life can help us make design decisions that support the resilience of our local habitats and communities.

OUTCOME Students will choose credible, relevant research sources to support the development of nonhuman personas, and use these sources to articulate a nonhuman's needs and challenges. Students evaluate design decisions based on the needs of nonhuman personas.

Level 1 2 3 4 5

SYNTHESIS

Some Beyond Human-Centered Shifts were moved to the category of Trans-Disciplinary, including this one.

Scrubbed use of "nonhuman," unless referring to flora and fauna.

Remove numbering from Levels; instead use words to describe the level of engagement with sustainability pedagogy methods.

Include courses this Shift could be used in.

REFINED SHIFT

LEVEL Complexity — **TRANS-DISCIPLINARY**

COURSE Digital Experiential Research

Create tertiary personas

Why?
A tertiary participant could include: people affected indirectly by the design, such as laborers, organizations, and communities; animals, including domesticated, livestock, and wild; and plants, trees, and fungi. When creating a tertiary persona, the process must be based in science and fact. This is different from a typical user persona, which tends to be based on market research. Students have to use sources that are as bias-free as possible and reputable, such as environmental agencies, traditional and indigenous ecological knowledge, and governmental bodies. Understanding the full context of our impact across all life can help us make design decisions that support the resilience of our local habitats and communities.

Outcome
Students will choose credible, relevant research sources to support the development of tertiary personas, and use these sources to articulate a tertiary participant's needs and challenges. Students can evaluate design decisions based on the needs of these personas.

view more resources at **shiftdeck.design**

Beyond Human-Centered

Identifying Nonhuman Participants

WHY Recognizing the true participants and actants in our work can help us understand the degree to which everything is interconnected. Recognizing plants and animals as participants is probably the least-complex nonhuman group to start with. Students could also think about technologies as participants, such as AI technologies, or considering human laborers as participants in a design. The plants that make up our paper, the people that collect our garbage, and the animals displaced in an urban environment are all affected by design. Being able to de-center our design from solely human values will be a huge asset for a climate resilient future.

OUTCOME Students will identify and justify nonhuman participants in the context of their design project.

Level 1 2 3 4 5

Beyond Human-Centered

Developing Nonhuman Personas

WHY A nonhuman participant could include: people affected indirectly by the design, such as laborers, organizations, and communities; animals, including domesticated, livestock, and wild; and plants, trees, and fungi. When creating a persona for a nonhuman, the process must be based in science and fact. This is different from a typical user persona, which tends to be based on market research. Students have to use sources that are as bias-free as possible and reputable, such as environmental agencies, traditional and indigenous ecological knowledge, and governmental bodies. Understanding the full context of our impact across all life can help us make design decisions that support the resilience of our local habitats and communities.

OUTCOME Students will choose credible, relevant research sources to support the development of nonhuman personas, and use these sources to articulate a nonhuman's needs and challenges. Students evaluate design decisions based on the needs of nonhuman personas.

Beyond Human-Centered

Planning for the End

WHY Having a plan for something when you're finished with it–an "end of life plan"–is a crucial step towards designing with resilient intention. Being able to articulate this plan is not only useful for resource conservation, but is a great practice for articulating your sustainable intentions to clients and employers. Developing a habit of understanding how a design will contribute to the environment in its "afterlife" is a crucial step towards designing a climate-resilient future.

OUTCOME Students will research effective strategies for regeneration, reuse, and recycling of a project's physical and digital components. They can present these strategies in a cohesive plan and defend their choices.

Level 1 2 3 4 5

Systems & Transitions

Circular Economies

WHY A circular economy is perhaps the most compelling solution to our current linear economy, and a great method for creating environmental sustainability in our economic systems. Many start-ups are prioritizing circular design in their development, and knowing how to design for such an economy is a benefit to students and to the environment. Circular design prioritizes keeping materials in useful circulation, rather than sending material to waste after its useful life is through. Our current economy follows a linear pattern of take/make/waste, which leads to over extraction of resources, overproduction of goods, and environmental harm.

OUTCOME Students define the principles of the circular economy, including reducing waste; designing for reuse, repair, and recycling; and prioritizing regenerative systems.

Systems & Transitions

Context is Everything

WHY Understanding how the things we design fit within our environment helps students understand the magnitude and complexity of our existing systems. Being able to see ourselves and our work as a part of a larger interconnected whole is a skill for building climate resilience. When students are aware of the real context of their design, they are able to make choices in material, messaging, and lifecycle that will better benefit the relationships of participants and environment. Educators can ask students to make a map that visually represents the environment (natural, man-made, and technological), human and nonhuman participants, and relationships present in the context of a larger design project.

OUTCOME Students design visual representations of their project's context and define areas for positive intervention. They may justify their interventions with research and participant co-design activities.

Level 1 2 3 4 5

Interdisciplinarity

Cross-Disciplinary Collaboration

WHY Data visualization and infographics transform the way we communicate complex information. Being well-versed in data visualization can help students understand the complex factors contributing to climate change. Designers of the future will need to collaborate with environmental scientists, engineers, and anthropologists–among many others–to affect change. Getting design students accustomed to working with those in other fields is a crucial step towards interdisciplinarity, and interdisciplinarity is a crucial part of solving large-scale problems. Instead of looking outward for data sources in design projects, consider looking within the university to foster collaboration. Design students can collaborate with students from a scientific discipline, designing an infographic or data visualization based on the study of the science student. Groups collaborate to ensure the visuals are an accurate and engaging representation of the data.

OUTCOME Students develop cross-disciplinary collaboration skills by working directly with peers in other disciplines to transform complex data into clear, engaging visual narratives that enhance viewer's

Economy

Carbon Calculators

WHY There are a myriad of carbon calculators available online, and learning to use one and interpret its results can help students be advocates for–and active participants in–resilient design in their future workplaces. Carbon calculators can be used to evaluate printed material, packaging, exhibition-related design, and digital or web-based applications. Getting in the habit of creating carbon footprint reports for design work means designers will always be equipped with data to help make and advocate for sustainable decisions.

OUTCOME Students utilize data from carbon calculators to document their project's carbon footprint. They critically evaluate their results and make material choices for the purpose of lowering the carbon footprint.

Level 1 2 3 4 5

Engagement with Policy

Sustainable Development Goals

WHY Governmental bodies (some of them) are making pledges to support initiatives of sustainability and climate resilience. Being ignorant of these goals is not in a designer's best interest, especially as more and more companies and cities are aligning their own goals with the UN's Sustainable Development Goals. Besides being noble goals for a healthy planet, the SDGs are rich sources of written content and data. Educators can use the UN's 17 SDGs as content for layout exercises, or have students design a concept around a goal of their choice. This helps design students become aware of global goals of climate resilience, and begin to see their own practice as one that can support these goals.

OUTCOME Students analyze the UN's Sustainable Development Goals, and determine how their design practice can help impact them in a positive way.

Honesty & Optimism

Bias and Misinformation

WHY In a time of climate disasters, technological advancements, and worsening political divides, it's necessary for students of design to have a healthy practice of identifying misinformation and bias. Designers are responsible for the messages they convey and the language they use, and must know how to avoid creating instances of misinformation and disinformation. Educators can give students opportunities to review examples of dishonest, biased, and misleading design, and make sure their students are aware of questionable marketing strategies like greenwashing and deceptive patterns.

OUTCOME Students critically analyze design for misinformation and bias, and identify methods for transparency and honesty in their own design practice.

Level 1 2 3 4 5

Economy

Press Sheets

WHY Knowing where designers can make interventions in the print production process can help students build projects that minimize waste. A good place to start is designing the press sheet for anything that is trimmed or die-cut. Designers can make more sustainable choices in their work with awareness of production processes and the places they can use design to make sustainable interventions.

OUTCOME Students plan and optimize their design to best fit on a press sheet for the purpose of generating the least amount of trim waste.

Engagement with Policy

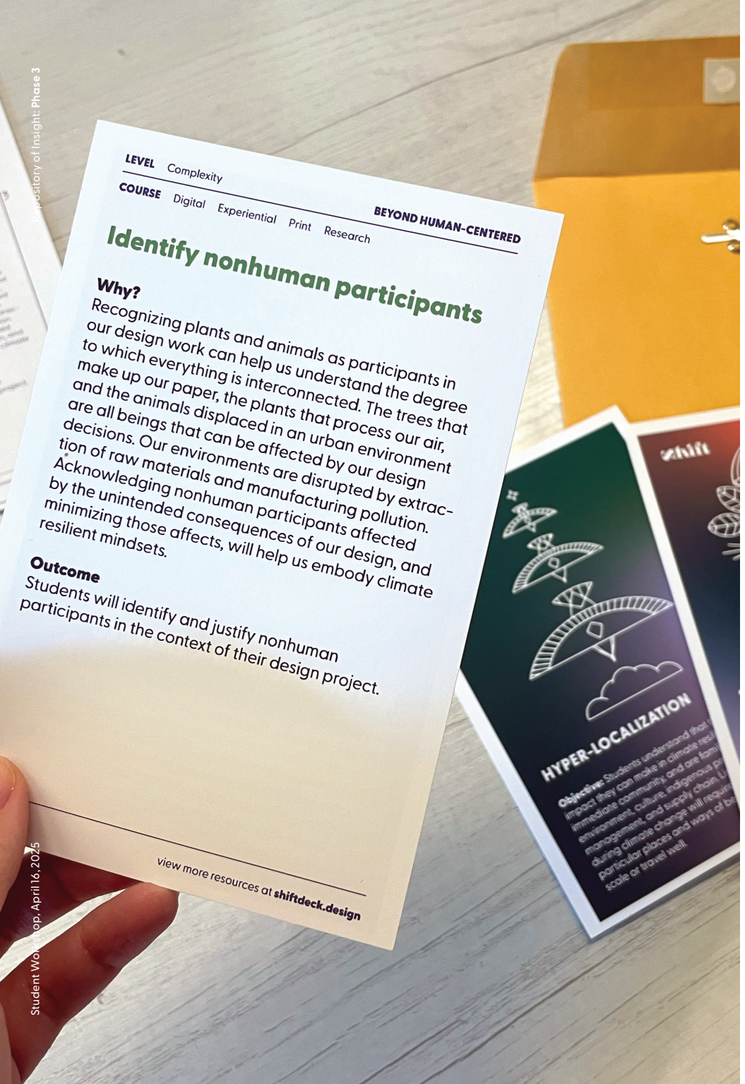
Climate Resilient Copy

WHY While students may not be actively engaging with the text or utilizing the information to support a design project goal, using climate resilient policy as body copy for design and typography projects brings these ideas to a student's attention. Requiring students to thoughtfully incorporate these tests into a layout exposes them to both climate resilient policy and the knowledge that governmental bodies–somewhere–are working towards these goals. Inspiration could be drawn from the UN's 17 Sustainable Development Goals, text from Project Drawdown's library of climate solutions, or text from local climate resilient policy.

OUTCOME Utilizing text from climate resilient policy, students present judicial use of typographical concepts to create an engaging page layout. Attention is paid to hierarchy, contrast, balance, and alignment.

Level 1 2 3 4 5

Left and Right: Example demo cards from the original shared testing prototype.



Phase 3

Student Workshop

DSGD 104: INTRO TO GRAPHIC DESIGN, SPRING 2025, TAUGHT BY CONNIE HWANG, SAN JOSÉ STATE UNIVERSITY

APRIL 16, 2025

Research Questions

How do students of design implement these shifts into their coursework? Are the shifts clear and concise enough for student comprehension? What kinds of questions do students have about implementation? Do they find this work to be compelling, necessary, and timely?

Participants

Students in DSGD 104: Intro to Graphic Design, Spring 2025, Taught by Connie Hwang at San José State University

Methodology

I presented my research to students during the early phases of the student's final project: an informative, physical installation that attracts attention to a campaign. I have been a Teaching Assistant all semester in this course, and the students have been creating assignments all semester that focused on a cultural storytelling topic of their choice, and this final project is a more physical, life-sized realization of their topic. This installation is also imagined to exist in a real physical location. It seemed like a great moment to introduce them to some Shifts.

Based on my previous experience with student workshops, I created a shorter presentation where I introduced the students to three mindsets, instead of all seven, and presented them with one Shift per mindset. I presented one Shift at a time, handed out physical copies of the Shift card, and then asked students to take notes on how that Shift could relate to or enhance their installation. The entire workshop took an hour; it was nice for me to have extra time, but it was also organized in such a way that the students did not seem to get bored or restless.

Because they were still in the brainstorming phase of this project, I felt this was a great exercise to get them thinking creatively about how to present their work, as well as a way to get them to consider how an installation can affect the environment and community of the location they chose.

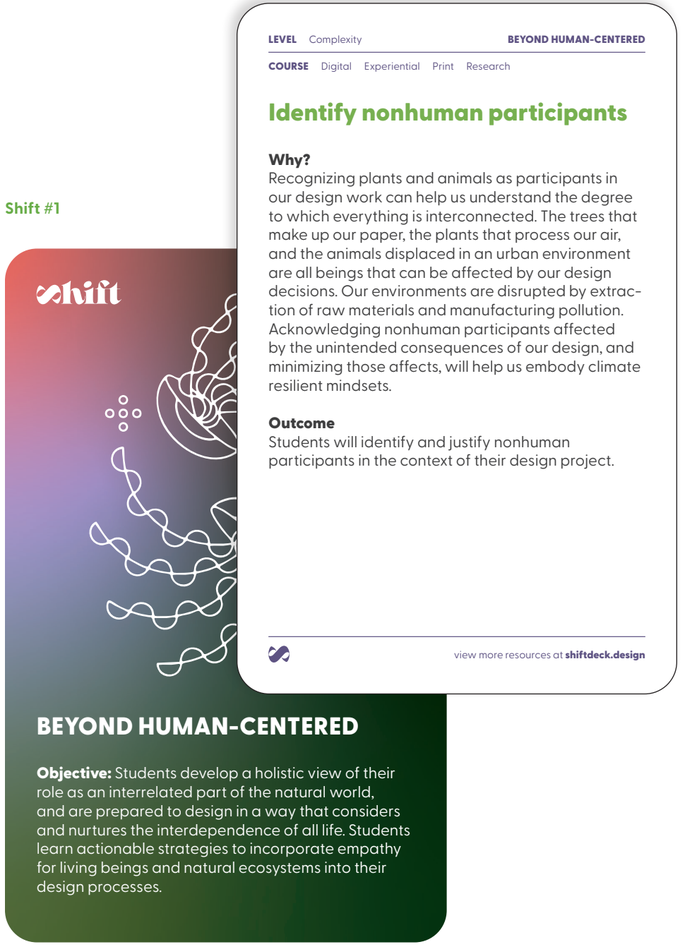
The 3 Mindsets & Shifts we investigated:

Mindset: Beyond Human-Centered
- **Rationale:** Because this project is imagined to exist in a real location, students can take the opportunity to consider the affect it will have on the ecosystem.

Shift: Identify nonhuman participants
- **Rationale:** Being mindful of the plants and animals that this installation may affect could be good inspiration for students whose topic is focused on environmental issues, and could be a great brainstorming prompt.

Left: The card prototypes I used for this workshop.

Shift #1



Shift #2

LEVEL Message **HYPER-LOCALIZATION**

COURSE Core Digital Editorial Experiential Print

Look for local projects

Why?
Educators and their students can meet the needs of their community by partnering with local small businesses and non-profit organizations who are in need of design. Educators can encourage students to draw inspiration from local culture and environment to create designed solutions that embody a hyper-local mindset. Communities can build resilience by building economic, cultural, and social connections across disciplines and generations.

Outcome
Students partner with local small businesses and nonprofits to fulfill design requirements with work that is relevant and centered around local needs and culture.

view more resources at **shiftdeck.design**

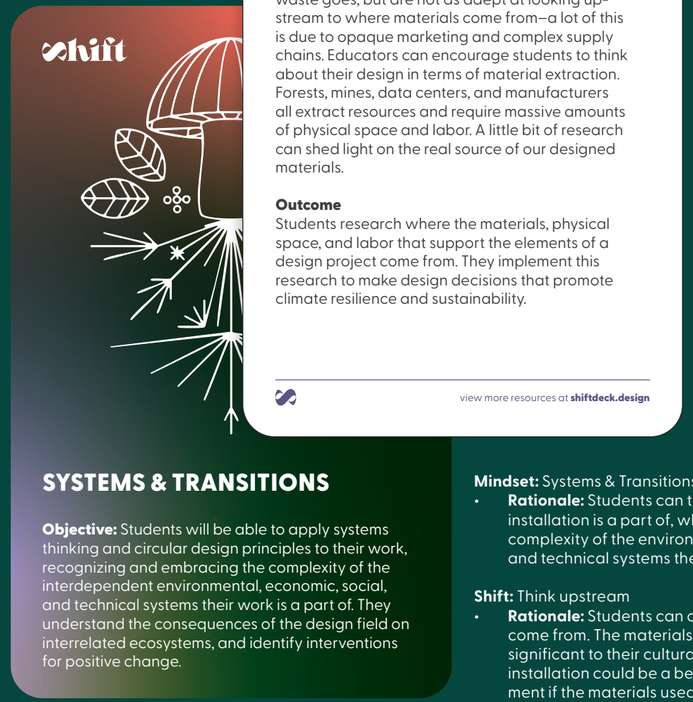
HYPER-LOCALIZATION

Objective: Students understand that the biggest impact they can make in climate resilience is in their immediate community, and are familiar with the local environment, culture, indigenous practices, waste management, and supply chain. Living sustainably during climate change will require adaptations to particular places and ways of being that may not scale or travel well.

Mindset: Hyper-Localization
- **Rationale:** Students can consider how their installation will contribute to its immediate location: the ecosystem, community, and culture its location is connected to.

Shift: Look for Local Projects
- **Rationale:** This is also highly related to student's topics in cultural storytelling. Exploring what small businesses, communities, or non-profits their installation could partner with helps students understand the importance of local support in building climate resilience.

Shift #3



LEVEL Critical Inquiry **SYSTEMS & TRANSITIONS**

COURSE Core Context Digital Editorial Experiential Print

Think upstream

Why?
Everything we create–every book, every digital artifact, every package–can trace its source to materials extracted from the natural environment. We are getting better at considering where our waste goes, but are not as adept at looking upstream to where materials come from–a lot of this is due to opaque marketing and complex supply chains. Educators can encourage students to think about their design in terms of material extraction. Forests, mines, data centers, and manufacturers all extract resources and require massive amounts of physical space and labor. A little bit of research can shed light on the real source of our designed materials.

Outcome
Students research where the materials, physical space, and labor that support the elements of a design project come from. They implement this research to make design decisions that promote climate resilience and sustainability.

view more resources at **shiftdeck.design**

SYSTEMS & TRANSITIONS

Objective: Students will be able to apply systems thinking and circular design principles to their work, recognizing and embracing the complexity of the interdependent environmental, economic, social, and technical systems their work is a part of. They understand the consequences of the design field on interrelated ecosystems, and identify interventions for positive change.

Mindset: Systems & Transitions
- **Rationale:** Students can think about the system(s) their installation is a part of, which introduces them to the complexity of the environmental, economic, social, and technical systems their work is a part of.

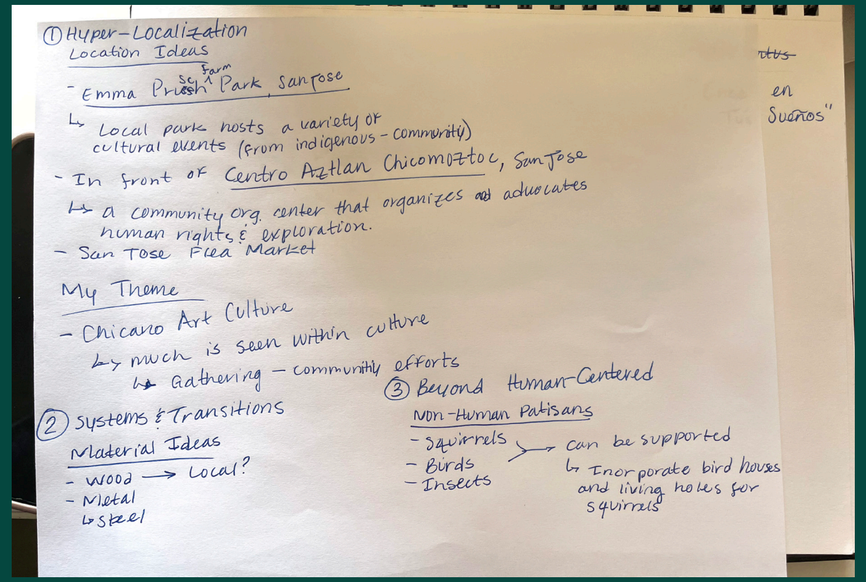
Shift: Think upstream
- **Rationale:** Students can consider where their materials come from. The materials for their installation can be significant to their cultural storytelling topics, and their installation could be a better contributor to its environment if the materials used are carefully considered.

Key Findings

The students were extremely diligent in taking time to take careful notes considering how each Shift related to their installation and cultural storytelling topic. After the workshop was complete, I requested permission to photograph everyone's notes. I present some on the following pages anonymously to emphasize the level of engagement with the topics presented and students willingness to engage with a heavy topic such as climate resilience.

Synthesis

This exercise was effective because each student had a different project to work on, and so certain Shifts appealed more to some students than others. I'm looking forward to testing Shifts in a setting where they are a part of a project's syllabus from the very beginning.

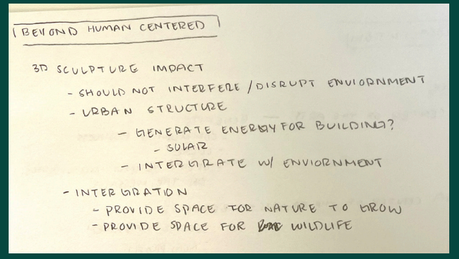


Student Example 1

This student's cultural storytelling theme is Chicano Art Culture. They focused on an installation in an important physical location to the Chicano community, and per the Hyper-Localization mindset thought about local organizations they could partner with.

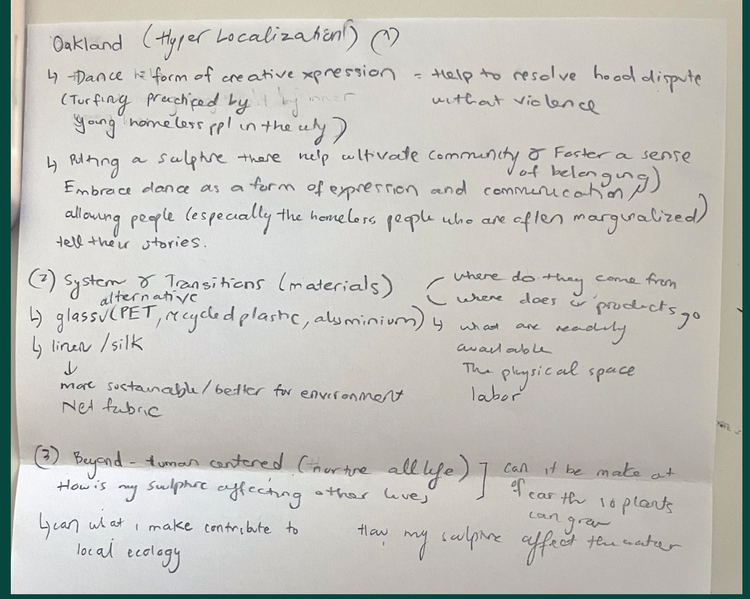
The student considered their material options for the Systems & Transitions mindset, and thought about sourcing local wood. Local steel, however, might be more of an issue to obtain.

For the Beyond Human-Centered mindset, they considered local squirrels, birds, and insects, and thought about incorporating spaces for those animals to inhabit in the structure itself.



Student Example 2

I found this student's take on the Beyond Human-Centered Mindset insightful–they considered how their structure might generate energy for the building it is associated with. This is a great way to think outside the box while still accomplishing your design goals.

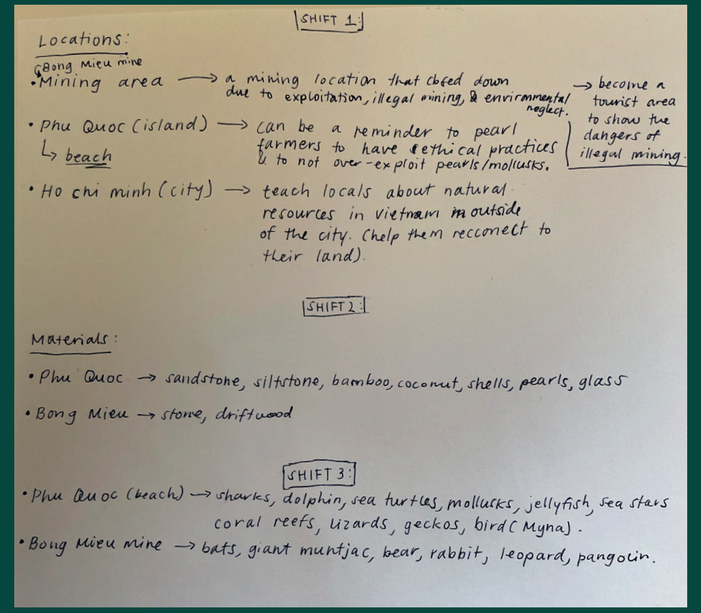


Student Example 3

This student is featuring jewelry as an important component of cultural storytelling in Vietnam, and is considering using jewelry connect the wearers to the laborers and materials that go into it. Illegal mining and the damage it causes to people and environment is an issue they can bring attention to.

This student has identified installation materials according to the Systems & Transitions Mindset, and they've identified nonhuman species affected by the mining of resources for the jewelery.

The next steps would be to determine how their installation could be a positive component of its environment, and have a positive affect on the local species of plants and animals.



Student Example 4

I found this student's take on the Beyond Human-Centered Mindset insightful–they considered how their structure might generate energy for the building it is associated with. This is a great way to think outside the box while still accomplishing your design goals.

Phase 3

Visual design Process

Mindset graphics,
Shift logo design

VISUAL DESIGN PROCESS DOCUMENTATION

In Michael Bierut's essay, "This is my Process,"[61] the author notes of his design process that "somewhere along the way an idea for the design pops into my head from out of the blue. I can't really explain that part; it's like magic." Throughout my master's studies, I've attempted to pay more attention to how my own design ideas manifest. I've narrowed it down to a combination of three things:

1. Get all the mediocre ideas out.
2. Occupy my mind with something else.
3. Sleep on it.

It was this very process that inspired the final iterations of the graphics for the 7 Mindsets. I was inspired by ancient human cave paintings and the Nazca lines of Peru as visuals that would link us to a time when humanity may have seen itself as a more interrelated part of the natural world. With this in mind I worked primarily in simpler line art, adhering to a grid. After two weeks of frustratingly attempting to design something interesting, making sure I get enough sunlight and movement, I thought, as I stepped out for a walk, "None of this is working. What else could I use to represent these mindsets besides abstraction? Animals? Plants? Biomimicry!"

While this felt like a lightning-bolt kind of realization, being immersed in climate resilient design methodology for years is what allowed my mind to make the connection between what I was studying and what I was creating. I am a big proponent of working in this way: immersing yourself in a topic, and then giving your mind space to make connections. Each mindset embodies a biomimetic strategy used by nature for cooperation, regeneration, and resilience. This concept does double duty by utilizing associative memory to link "biomimetic strategy" to "mindset" while educating the user about an aspect of climate resilient design.

I consider the visual design of this project to be an important component of its success, due to the fact that my target audience is visual communication design educators. What follows is an analysis of my design process.

Design Direction 1: Lettering

Inspired by Fer Cozzi's custom typeface *Audaz* for Nike's, "No pride, no sport" campaign, I thought I would create large, type-driven compositions to represent the mindsets. I experimented with creating one "odd" letter to represent the mindset, which I would then set against a nice geometric san serif for the remaining letters in the mindset's title.

I worked on the "E" for Economy and the "I" in Interdisciplinarity, creating some geometric abstractions that kind of vaguely represented the ideas of economy and interdisciplinarity. Ultimately I abandoned this direction because I didn't think the letters-as-symbols would be able to stand on their own.

[61] Bierut, *Now You See it: And Other Essays on Design*, 20.

Left: Image from *Lascaux Cave: Unveiling the Secrets of Prehistory*, https://www.visit-dordogne-valley.co.uk/discover/natural-heritage/prehistoric-caves/lascaux-0

Right: Image from *Nazca Lines, Peru* https://www.britannica.com/place/Nazca-Lines

Design Direction 2: Abstraction

I clung to the idea of visual abstraction and began to think in pattern. Perhaps these visual abstractions of the ideas of the mindsets could be placed in a square or hexagonal grid for a modern quilted effect. The result resembled the abstract cover of an elementary science textbook, and honestly, it looked boring. I really wanted this to work; I loosened my grid, and made some truly mediocre abstract Things. I began to get frustrated that the visual elements of my thesis project would not reflect the research and thought that went into the conceptual elements.

Final Design Direction: Biomimicry

This is the bolt-of-lightning moment: using biomimicry, a method for climate resilience, to develop the visual representations of climate resilient design mindsets. I researched biological strategies that embodied the core tenets of the *7 Mindsets of Climate Resilient Design* on the website AskNature.org, an online resource created by The Biomimicry Institute to explore nature's solutions to complex problems.

I had a few issues along the way, but the process went fairly smoothly. I stuck to a simple line drawing that adhered to a strict grid. I feel this is necessary to visually convey the idea of the structure and complex systems that support the way we live our lives. There are a couple graphics that deviate from perfect symmetry; I felt it was more important to effectively illustrate the biological strategy than it was to practice symmetry. The graphics all represent transition in some way, whether in physical movement or states of being. This hints to the transition necessary to become more climate resilient.

As a final step in my design process, I wanted my lines to look less exact; almost as if they had been painted with a finger, as with the ancient cave paintings I drew inspiration from. TO accomplish this I used Adobe Illustrator's roughen effect, then applied a Gaussian blur to the lines. I then converted the line art to a raster image and performed an Image Trace. Setting the threshold very high allowed me to generate a line that was just inconsistent enough to look hand-drawn, with corners and intersections that widened a little bit to add to that illusion.

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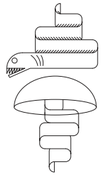

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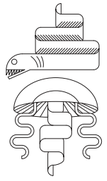

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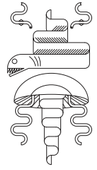

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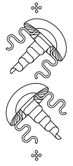

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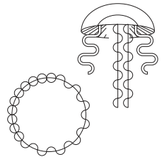

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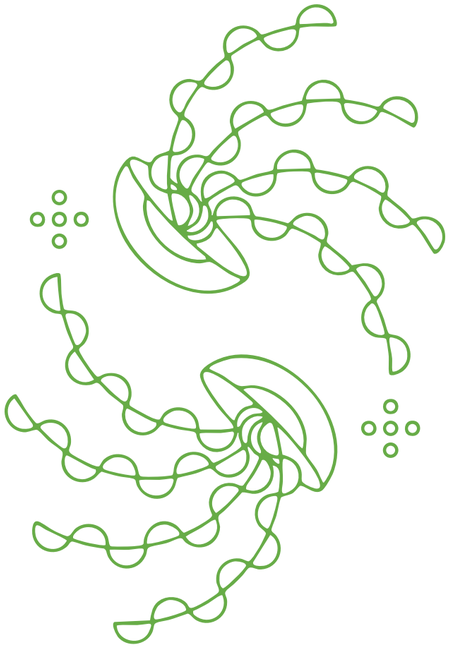


Final

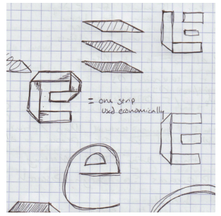
BEYOND HUMAN-CENTERED MINDSET GRAPHIC PROCESS

The deep ocean is perhaps the only place on Earth where humans are not present. Except maybe for the plastic littering the ocean floor, the ocean is a place devoid of human activity. The beings who call this place home have no concept of humanity, and get along quite fine without a notion of what exists above them. In fact, they'll likely continue to get along just fine until well after we're gone. They operate in a space that is truly beyond human-centered.

The mindset Beyond Human-Centered was the most difficult for me to map to a biological strategy. My first inclination was to illustrate the narrative from the RadioLab episode *Corpse Demon*, a story about the Zoroastrian practice of excarnation, and how an anti-inflammatory drug given to cattle almost decimated an entire ecosystem by way of vultures. However, this resulted in graphics that were very, well, bird-heavy. Chickadees represent interdisciplinarity, Starlings represent Hyper-Localization, and an egg and nest represent Honesty & Optimism. I felt that adding a vulture to my animal coterie would skew my visuals in a way that lent unnecessary importance to birds. I wanted my visuals to represent biological strategies from across the plant and animal kingdoms. Plus, using a vulture to represent Beyond Human-Centered is a little heavy-handed, even if the storytelling is on-point.

I began to look for biological strategies Beyond Human-Centered in the ocean, but didn't have much luck. My advisor Mara Holt Skov also suggested I look to the sea, bringing up a very good point that the beings living in the deep ocean have absolutely no concept of humanity–whether humans thrive or not, nothing changes for them. They are truly living their lives beyond the influence of humans. I drew my visual inspiration from the Giant Phantom Jelly, an animal that lives at ocean depths of up to 22,000 feet and has only been sighted nine times,[62] although I also experimented with a including a deep sea eel in the visual as well.

[62] Monterey Bay Aquarium Research Institute, "Giant Phantom Jelly."



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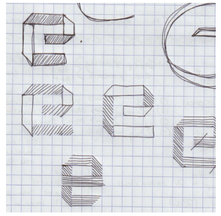

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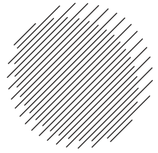

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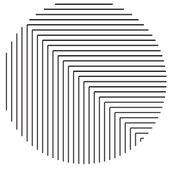

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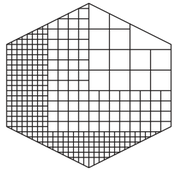

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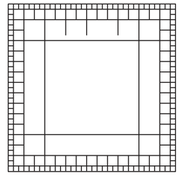

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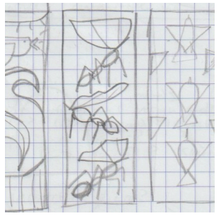

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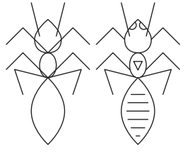

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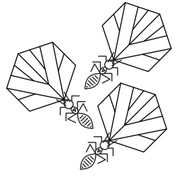

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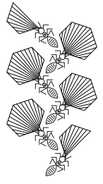

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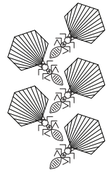

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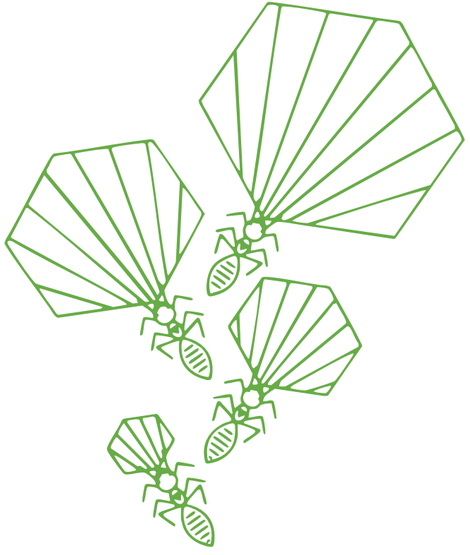

Final

ECONOMY MINDSET GRAPHIC PROCESS

Leafcutter ant colonies have a strategy to economically transport and distribute leaf cuttings. Forager ants collect leaf cuttings and bring them back to the colony, where processor ants collect and distribute the cuttings.35 You would think that a leafcutter ant would want to bring back the largest cutting possible, but the ants have an efficient strategy. There are more forager ants than processor ants, so the forager ants have to bring leaves back at a steady pace so that the processor ants don't get overwhelmed. Forager ants travel in a single-file line; if one ant is carrying too heavy a load they could slow the entire line. The ants transport leaf cuttings that are the optimum size to maintain a steady traveling speed and a reasonable workload for the processor ants.

I explored visual interpretations of the letter "E,"implying the form through abstract visuals. I experimented with the idea of stacked sheets of paper to form the three horizontal lines on the "E," or a long, twisting ribbon of paper.

Shifting to the visual process for the pattern direction, I wanted to maintain a minimal aesthetic while still conveying a strong conceptual message of economy. It was really difficult to make a pattern that was both visually interesting and conveyed the idea of economy.

When I began the biological strategy-based design process, I immediately discovered leafcutter ants, known for their efficient labor. This direction opened up new possibilities: I began considering how the ants' paths and the veining of leaves could inform the layout. Varying the size of the leaves added a sense of rhythm and progression, supporting the narrative of the ants' activity and purpose.

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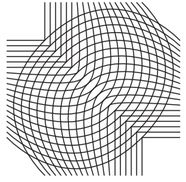

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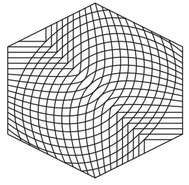

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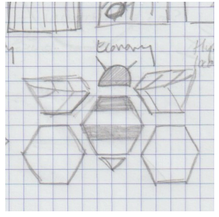

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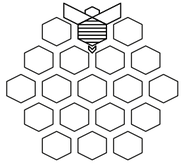

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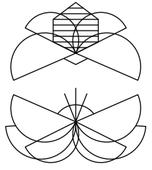

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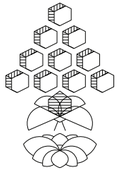

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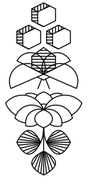

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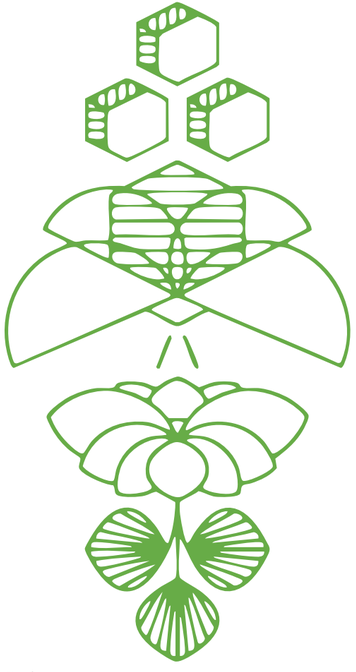


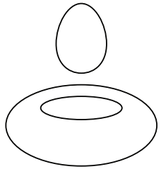
Final

ENGAGEMENT WITH POLICY MINDSET GRAPHIC PROCESS

When a beehive has reached its capacity, it becomes necessary for some members of the hive to relocate. Rather than just sending bees away, scout bees leave their home hive to search for a suitable second location. When a scout finds a nice spot, he returns to the hive and uses a complicated dance to communicate the location and desirability of the potential new hive. Interested bees fly out and gather to assess the proposed site. When the number of bees gathered at a location reaches about 15, the group heads back to the main hive to announce that they've decided on a new location.39 Honeybees engage with new hive policy to vote by quorum on a site for a second hive.

This piece began with an exploration of ripples—specifically the idea of two ripples intersecting in a pond and altering one another's form. While conceptually rich, the visual execution lacked impact.

When I began the biological strategy-based design process, I thought of a biological strategy I had learned about during my internship with the Climate Art Creative Network: when a beehive becomes too crowded, it splits, and bees choose a new home through a quorum-based decision-making process. I confirmed this behavior through additional research on asknature.org. I incorporated the idea of bees carrying the structure of the new hive with them in initial design iterations. I eventually limited the number of honeycombs, whose hexagonal shapes were echoed in the design of a flower. To emphasize the importance of the bee's role in this story and to further reinforce this visual idea of transition, I made the bee larger than the flower.



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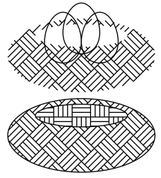

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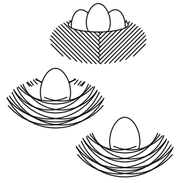

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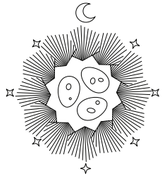

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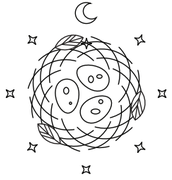

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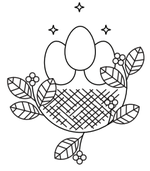

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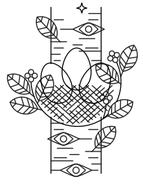

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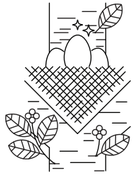

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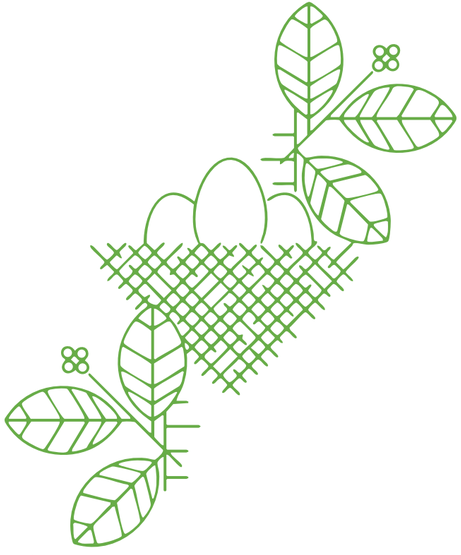


Final

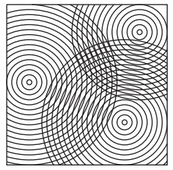
HONESTY & OPTIMISM MINDSET GRAPHIC PROCESS

Nest building is a carefully considered, evolving process. Birds choose nesting sites based on past brood success, weather, predators, and the actions of their bird neighbors.43 If a brood fails, the mother bird will consider the factors that led to that failure and choose a more appropriate nesting site next season. Birds are honest about their nests' shortcomings and optimistic about raising a successful brood the next season.

And I can think of no natural symbol more optimistic than an egg–a fragile, small shell holding a future generation.

Exploring the concept of honesty in nature proved unexpectedly challenging. Many biological strategies that come to mind–like mimicry or camouflage–are rooted in deception, which I wanted to avoid. I was drawn instead to bird nesting behavior. The bird nesting analogy is perfect - birds are honest about their nest's shortcomings, and based on that reflection are optimistic for success next season.

Eggs are optimistic by nature, as they represent the continuation of life. However, they posed a visual challenge due to their simplicity and asymmetry, which clashed with the more balanced compositions I was aiming for. I experimented with incorporating celestial elements like the sun, moon, and stars to introduce the idea of cycles and renewal. Ultimately, placing the nest within the context of a tree grounded the visual, while the asymmetry of the leaves added visual interest and balance.



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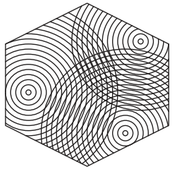

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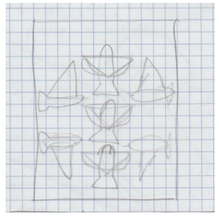

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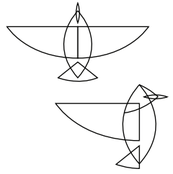

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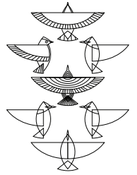

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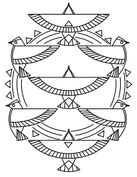

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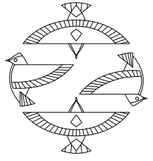

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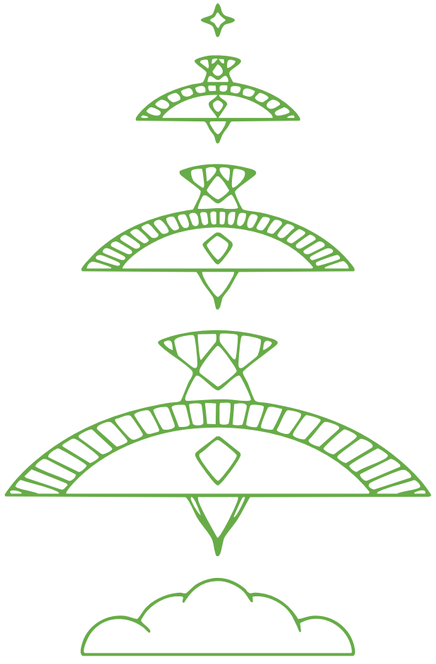


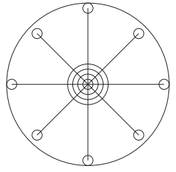
Final

HYPER-LOCALIZATION MINDSET GRAPHIC PROCESS

Every evening, thousands of starlings take to the sky in one huge flock, creating massive, undulating forms called murmurations. The birds race and dive in extremely close proximity—sometimes only inches from each other. Scientists have found that in order for the birds to move so cohesively when presented with the uncertainty of the movements of thousands of other birds, they only need to pay attention to their seven closest neighbors.45 By limiting their focus to their immediate surroundings, the birds are able to make complicated movements without disrupting their neighbors. This hyper-localization results in beautiful, complex movements with fluidity and coordination.

My initial pattern-based explorations into hyper-localization originated with the concept of ripples as a metaphor: the idea that our actions ripple out wider than ourselves, but have the greatest effect closer to us. I wanted to build on this idea through the lens of collective movement, which led me to starling murmurations, a reference point from my earlier work with the Climate Art Program.

Starlings avoid collisions by focusing on just their seven nearest neighbors. This strategy informed my early design experiments, where I tried incorporating seven birds into the composition. However, this proved to be too visually dense. I ultimately reduced the number to three birds. To further support the theme of transition, I introduced a star and clouds to represent the transition from day to night—a nod to the time of day when murmurations begin.



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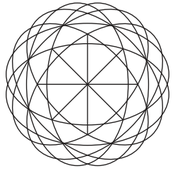

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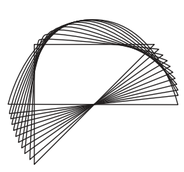

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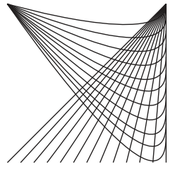

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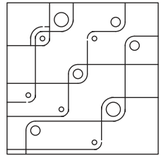

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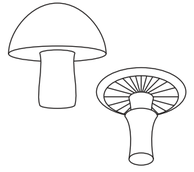

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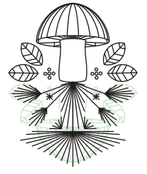

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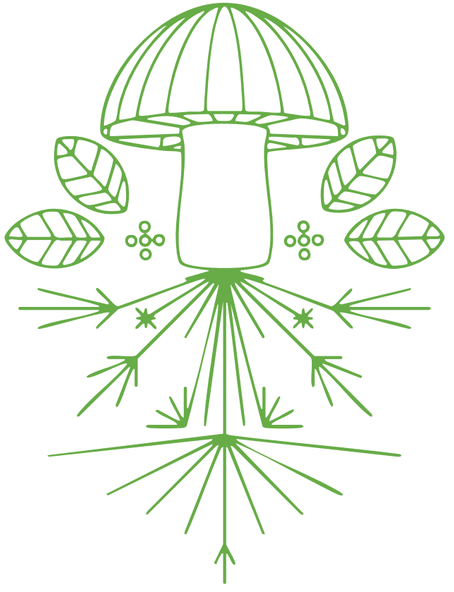


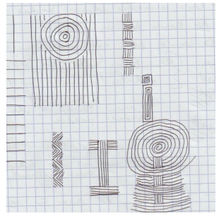
Final

SYSTEMS & TRANSITIONS MINDSET GRAPHIC PROCESS

Mycorrhizal fungi, small threads of mycelium that make up a vast underground network, live in a mutualistic partnership with other plants. Mycelium acts as a network between trees, plants, and other fungi, sending water, chemicals, and signals throughout the forest. If a larger tree has an oversupply of nutrients, mycelium shuttles the extra to other trees and plants that may have a deficiency. If a tree is being attacked by a pest, it can send out a warning through the mycelial network, allowing other trees to bolster their defenses. These networks help forests function by optimizing resource sharing to benefit the whole ecosystem.

I initially thought this mindset would lend itself well to a pattern-based design, and I expected it to be visually interesting. However, none of my early experiments felt successful or satisfying. Despite that rough start, this turned out to be one of the quickest graphics to resolve once I shifted directions to biological strategy-based visuals.

Underground networks of mycorrhizal fungi connect and nourish plant life. This biological strategy featured prominently in the Bioneer's 2024 conference, and I quickly connected them to my illustration. In visualizing the fungal "roots," I mirrored the rough size and structure of the fungi above ground. The only big change I made was simplifying the number of root nodes, which helped maintain visual balance and prevented the composition from feeling too bottom-heavy.



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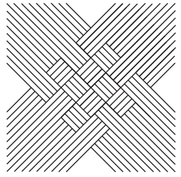

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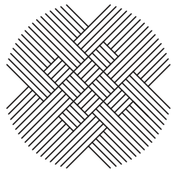

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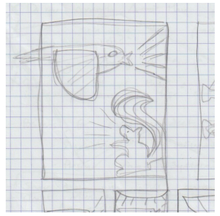

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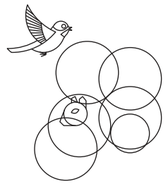

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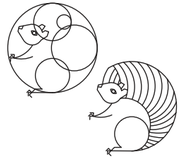

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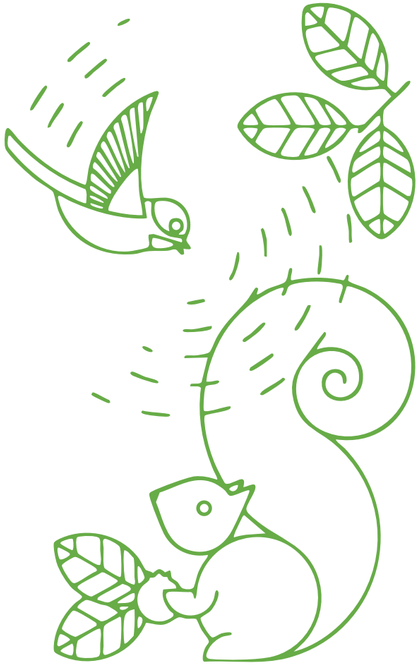


Final

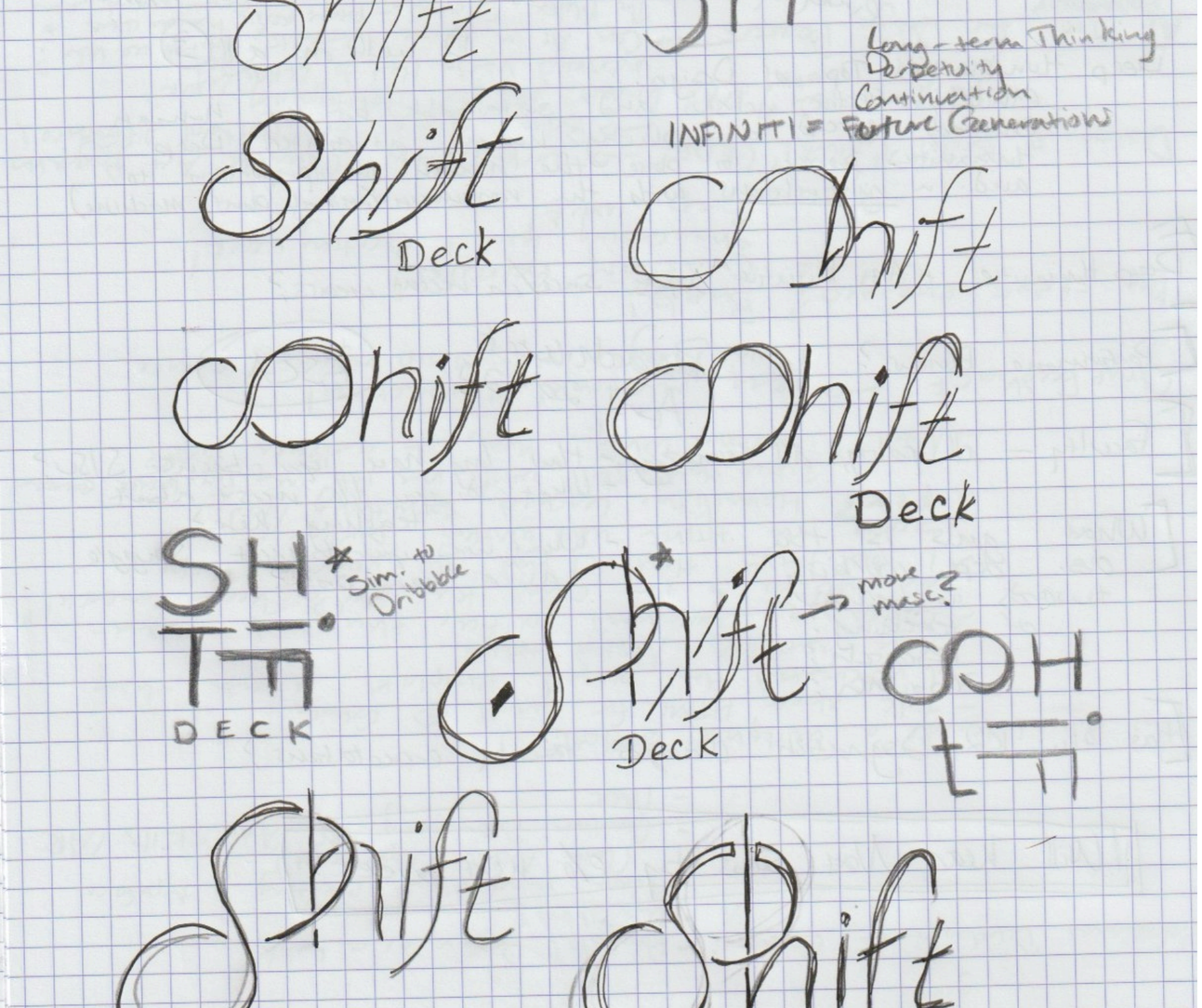
TRANS-DISCIPLINARY MINDSET GRAPHIC PROCESS

Black-capped chickadees use a warning call—it sounds like "seet"—to warn other chickadees of a predator in the area. The warning call is so high-pitched and faint that predators, such as owls or hawks, can't hear it. Chickadees who make this call are giving their fellows an effective advance warning. Other species, including nuthatches, jays, squirrels, and chipmunks also recognize this warning call and will take cover when they hear it. By utilizing this transdisciplinary warning system, these small animals can spend more of their precious time foraging and less time on alert for predators.

This graphic presented the greatest design challenge for me. Initially the mindset was called "Interdisciplinary," so I began with explorations of the letter "I" and abstract gridded patterns that referenced weaving—an early attempt to reflect the idea of different disciplines working together. While this had conceptual potential, they felt flat and lacked the visual interest I was aiming for.

As my process evolved, this was the most difficult graphic for me to design. I knew I would need to represent interplay between a chickadee and another small animal; I chose a squirrel because it is easily recognizable, although it could also have been a chipmunk or another type of bird. The squirrel, however, posed its own design challenges. Its form is more complex than other animals I had illustrated, and I struggled to strike the right tone—it either skewed too realistic or veered into overly cute, cartoonish territory. The tail in particular was a sticking point.

Eventually, the tail evolved into a stylized spiral, which helped anchor the composition and echoed the motion and repetition found in the lines of the chickadee's warning call. That call, the "seet," serves an important function of alerting not just chickadees, but other nearby small animals of danger. Squirrels, by recognizing this call, can spend more time foraging and less time on alert. To highlight this behavior, I illustrated the squirrel holding a foraged blueberry. The leaves at the top-right and bottom-left of the image provide some visual balance and separate the image into ground-level activity and tree-level activity.



Left: The initial process sketches as I developed design directions for the Shift Deck logo.

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THE SHIFT DECK IDENTITY PROCESS

I wanted to include the symbol for infinity in my final design, as it reflects my calling intention: ***How can I cultivate long-term thinking with future generations so that we inspire resilience?*** The infinity symbol also reads visually as an "S" when it is vertical, and as infinity when it is horizontal. No matter how you "shift" the logo, you can still interpret its meaning.

This identity was a real challenge, because I altered a real typeface—Arsenica Variable—to turn the "S" into the symbol for infinity. Altering a letter in a typeface is especially challenging because the designer would want it to look like it belongs with the typeface. It needs to maintain its proportions, angles, and visual character. To achieve this, I ultimately combined the upper-case "S" with the terminal and bowls of the letter "c." This is a variable font, and so I was able to have exacting control over the weight of the text and the optical size of its terminals and finials. The heaviest weight combined with the lightest optical size created a visually pleasing combination. I shifted the dot over the "i" to the left to further imply the verb "shift," and I connected the crossbar of the "f" and "t."

Phase 4

Introducing the Shift Deck

Pragmatic Design Pedagogy Interventions for Climate Resilience, Knowledge Base, thesis exhibition

PHASE 4: INTRODUCING THE SHIFT DECK

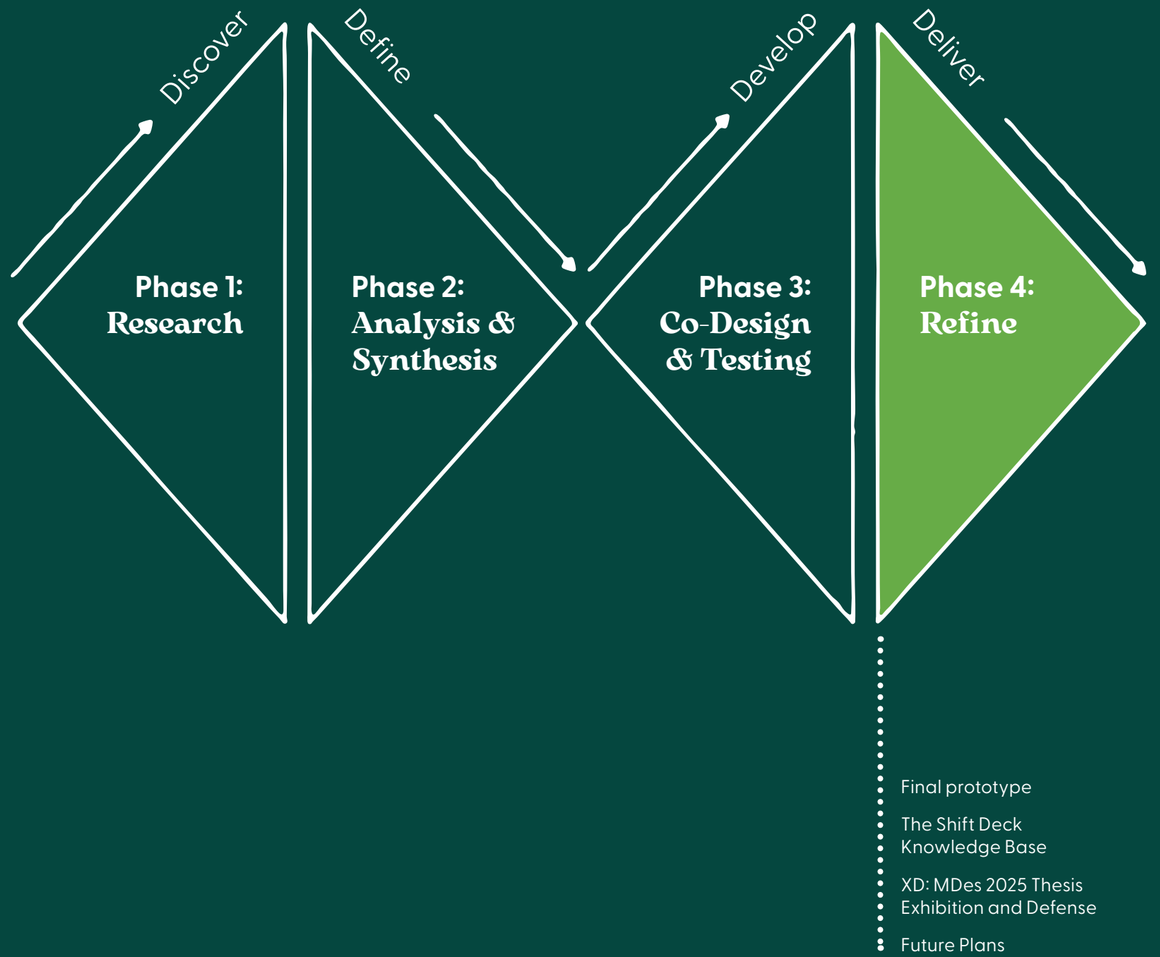
Left: Installing the posters for the MDes XD thesis exhibition

Here we are, in the final phase: continued refinement, and presumably more iteration after that. These Shifts are transitional–meant to fill a gap while climate-resilient projects are developed and adopted and the role of a visual communication designer continues to expand and evolve. I would love to turn this into a series of projects and courses to meet the moment, when that moment comes.

In the meantime, I would like to submit my research to a journal, and create a case study of my design process for the Mindsets. I'm partnering with Climate Designers, an organization dedicated to helping designers see themselves as climate leaders, as a research strategist to guide more research into climate resilient pedagogy. And I will continue to make the Shift Deck available and work with educators to transition their teaching .

And this will, of course, inform my own teaching. I plan to pursue the development of an elective that teaches Climate Resilient Design methodology, as well as incorporate these Shifts into my own teaching.

What follows is the final(ish) Shift Deck, a brief exploration of the Shift Deck Knowledge Base, and a recapitulation of the final thesis exhibition and defense.



Left: The Shift Deck on display at the 2025 XD MDes exhibition at San José State University.

THE SHIFT DECK

Tomorrow's design leaders will need to be resilient in the face of tumultuous change.

The Shift Deck is a deck of cards that inspires visual communication design educators to spark change through a practical framework of small but powerful shifts towards climate resilient design that enrich student projects, empowering the next generation of designers to lead the transformation our world needs.

Each card is a Shift–something a student can do or learn within the context of an existing design project or assignment that will support climate resilience. These are 27 small but powerful steps like using a carbon calculator, or eliminating waste. They are written as learning outcomes so educators can easily fit them within their pedagogy, and are further categorized into levels, courses and mindsets. An online knowledge base complements the physical deck.

In the following pages I've included the instruction booklet, and every single card in the Shift Deck. The cards are organized so that the "backs" of the cards, with the mindset and image, will display first, and the "fronts" of the cards that are categorized in that mindset will be displayed next.

INSTRUCTION BOOKLET: BACK, INTERIOR, FRONT

How can I cultivate long-term thinking with future generations so that we inspire resilience?

view more resources at **shiftdeck.design**

5 Levels of Sustainability Pedagogy in Design Education

Content Level: Sustainability as passive content. Professors provide students with content for layout that speaks directly to the climate crises or other sustainability issues. This passively brings the content to the student's attention, but doesn't invite any further consideration.

Message Level: Climate resilience delivered as a message. Students may be asked to design a project that promotes a message or idea about ecological sustainability–this is usually a data visualization, poster, or awareness campaign.

Material Level: Sustainability as a material concern. Students learn about sustainable production practices, local recycling requirements and limitations, and explore concepts of physical and digital carbon footprints.

Complexity Level: Climate resilience as a lens for understanding complexity. Understanding how the systems that support us are interconnected and working to transition those systems towards more sustainable and equitable goals are often cited as key strategies for addressing climate change.

Critical Inquiry Level: Sustainability and climate resilience as critical inquiry. Professors may dive deeper into sustainable inquiry, exploring abstract concepts, processes, aesthetics, and societal values related to sustainability and visual communication.

7 Mindsets of Climate Resilient Designers

Each mindset describes knowledge and practice that is essential for climate resilient design.

- **Beyond Human-Centered**
- **Economy**
- **Engagement with Policy**
- **Honesty & Optimism**
- **Hyper-Locality**
- **Systems & Transitions**
- **Trans-Disciplinary**

Compatible Courses

Any individual Shift may be better suited for certain types of design courses than others. Courses are organized into the following categories:

- **Context:** Design history, contextual studies, critical issues
- **Core:** Design fundamentals: intro, typography, identity, type and image
- **Digital:** UI/UX, web design, motion graphics
- **Editorial:** book, magazine, publication design
- **Experiential:** Designing physical spaces: environmental, exhibition, experiential, wayfinding
- **Print:** Prepress and production, packaging design, and print methods
- **Research:** Design research, human factors, or design thinking

shift Deck

Pragmatic Design Pedagogy Interventions for Climate Resilience

Cindy Raspiller
SJSU MDes XD 2025

INSTRUCTION BOOKLET: INTERIOR ABSTRACT, INTERIOR GUIDE

Abstract

In response to the impacts of climate change on environmental, societal, technological, and economic systems, students of visual communication design need a new vocabulary and improved skill set to advocate for effective change in a world that is in dire need of it. The commercial popularity of human-centered design methods has resulted in a design culture where the needs of humans dominate design processes. But what if a human-centered mindset doesn't make our lives better–what if, by placing human needs at the center of everything we design, we're reinforcing the idea of humanity as beneficiaries of Earth's ecology, rather than as a part of an interrelated ecosystem? To de-center the human in the design process is to acknowledge that the welfare of humanity depends on the welfare of all life on Earth.

To design climate resilience into our companies, communities, and governments, designers need to be aware of the ideas and methods available to them to understand the complexity and interdependence of the large problems we face. Climate resilient design methodology is not often taught as a part of visual communication curricula for a variety of reasons. Communication design is not substantially physical in nature. Climate resilience is considered academically separate from design. Professors do not have the flexibility to introduce new projects or courses into their curriculum, often see these ideas as too niche to be part of established curricula, and often worry they need more training to teach climate resilience.

A growing cadre of designers are advocating for circular economies, responsible design choices, and life-centered design models. Students of design feel a disconnect between the skills they are taught and the complexity of problems facing the planet, and are not often aware of climate resilient design methodology until well after they have entered the workforce. This creates a gap in action that the design industry cannot afford.

Through an iterative design prototyping process and classroom case studies I've developed a deck of cards that present small steps–or shifts–educators can take to weave climate resilient strategies into their existing assignments. The Shift Deck is organized into mindsets; ways of thinking that contribute to a well-rounded understanding of sustainable design and climate resilient action. Each shift includes a rationale for its climate resilience and a learning objective that states what students should know and be able to do as a result of incorporating the shift into their work. This bottom up approach allows educators to advocate for climate resilient design practices in the classroom without completely overhauling their pedagogy. With continued refinement and co-design, these shifts have the potential to cultivate a generation of designers whose work is creative, thoughtful, and resilient.

A thesis project presented in partial fulfillment of the requirements for the degree of Master of Design with a specialization in Experience Design at San José State University in San José, California.

Printed on 100% Post-Consumer Recycled Paper

How to use the Shift Deck

Each card describes a **Shift**: something a student can do or learn within the context of an existing design project or assignment that will support climate resilience.

Educators can incorporate a Shift into an existing project or assignment, or use a Shift as inspiration to design a new one. More resources and inspiration are available online at **shiftdeck.design**.

Each Shift is aligned with one of the **5 Levels of Sustainability Pedagogy** to help educators discern the level of engagement with climate resilient methodology the shift provides.

Each Shift belongs to one of seven **Mindsets of Climate Resilient Designers**, written as learning objectives that describe knowledge and practice the mindset embodies.

Who is the deck for?

The deck is designed for postsecondary educators of visual communication design, but any designer could apply these Shifts to their own work.

Card map

CARD FRONT

1 Level of engagement with climate resilient methodology

2 The Shift's Mindset

3 Compatible design courses or topics

4 The Shift

5 Why does this Shift contribute to climate resilience? Why is it important?

6 What students should know and be able to do as a result of incorporating this Shift into their project

CARD BACK

7 Graphic: a biological strategy that characterizes the mindset

8 The Mindset's title

9 Student competencies necessary to embody this mindset

Back

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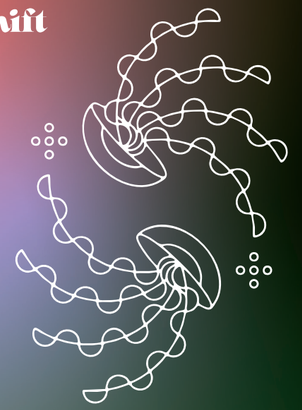
Left: A mockup that shows how the instruction booklet is folded.

shift



BEYOND HUMAN-CENTERED

Objective: Students develop a holistic view of their role as an interrelated part of the natural world, and are prepared to design in a way that considers and nurtures the interdependence of all life. Students learn actionable strategies to incorporate empathy for living beings and natural ecosystems into their design processes.

LEVEL Critical Inquiry — **Beyond Human-Centered**

COURSE Core · Experiential · Print · Research

Mimic biological strategies

Why?
Our natural world thrives as a cohesive, adaptive, sustainable ecosystem. Students can study asknature.org, a project by the Biomimicry Institute, to learn ways nature has solved complex problems. Educators can encourage their students to incorporate biological strategies into their designs for graphics, packaging, digital applications, and exhibitions. This builds a climate resilient design thinking mindset in students who will look to nature for innovation and inspiration.

Outcome
Students research biological strategies and can effectively translate them into solutions for design problems.

view more resources at **shiftdeck.design**

Asknature.org is a fantastic resource for any manner of educational activities.

LEVEL Complexity Material **BEYOND HUMAN-CENTERED**

COURSE Digital Editorial Experiential Print

Eliminate waste

Why?
In nature, waste becomes nutrients for life. Having a plan for something when you're finished with it–an "end of life plan"–is a crucial step towards designing with a mindset beyond human-centeredness. Developing a habit of optimizing how a design will contribute to the environment in its "afterlife" is critical for resource conservation, will add depth to one's design process, and will signal climate resilient intent to clients and employers.

Outcome
Students will research effective strategies for regeneration, reuse, and recycling of a project's components. They can present these strategies in a cohesive plan and defend their choices.

view more resources at **shiftdeck.design**

LEVEL Complexity **BEYOND HUMAN-CENTERED**

COURSE Digital Experiential Print Research

Identify nonhuman participants

Why?
Recognizing plants and animals as participants in our design work can help us understand the degree to which everything is interconnected. The trees that make up our paper, the plants that process our air, and the animals displaced in an urban environment are all beings that can be affected by our design decisions. Our environments are disrupted by extraction of raw materials and manufacturing pollution. Acknowledging nonhuman participants affected by the unintended consequences of our design, and minimizing those affects, will help us embody climate resilient mindsets.

Outcome
Students will identify and justify nonhuman participants in the context of their design project.

view more resources at **shiftdeck.design**

LEVEL Complexity **BEYOND HUMAN-CENTERED**

COURSE Digital Experiential Print Research

Create tertiary personas

Why?
A tertiary participant could include: people affected indirectly by the design, such as laborers, organizations, and communities; animals, including domesticated, livestock, and wild; plants, trees, and fungi. Tertiary personas must be based in scientific research and ecological knowledge, while typical user personas are based on market research. Students utilize reputable resources to build these personas, such as those from environmental agencies, indigenous ecological knowledge, and scientific research. Understanding our impact across all life can help us make decisions that support design beyond human-centered.

Outcome
Students will choose credible, relevant research sources to support the development of a tertiary persona, and use these sources to articulate a tertiary participant's needs and challenges. Students can evaluate design decisions based on the needs of these personas.

view more resources at **shiftdeck.design**

LEVEL Critical Inquiry **BEYOND HUMAN-CENTERED**

COURSE Core Experiential Research

Understand our place *in* nature

Why?
Humans often see themselves as having control over ecology, rather than being an interrelated part of it. This is especially true when we are taught to design with a human-centered mindset. Encouraging students to experience their place in nature can help nurture a mindset of climate resilience beyond human-centeredness. Give students ample time to be outdoors, to draw inspiration from the colors, patterns, and textures of nature. Encourage students to physically be in the space their materials come from, like forests, mountains, and lakes.

Outcome
Students understand their role as an interrelated piece of Earth's ecology, and learn to make choices in design and research that are sustainable and regenerative.

view more resources at **shiftdeck.design**

"We do not design for humans. Customers are only transient users of our products. We ultimately design for the environment. Your product will likely outlive your end user and inhabit the environment for much longer. We need to expand the life cycle of a design and plan for postuse."[63]

I originally used the term "nonhuman" as a catchall for all participants not deemed "the user." This was problematic for a variety of reasons, and I ended up using the words "nonhuman" to refer to those literally not-human, and "tertiary" to refer to other human participants.

Dividing participants into "nonhuman" and "tertiary" categories allowed me more space to explain what each means and why they are significant.

"Recognizing our true place in nature gives us new responsibilities. We discover that caring for the natural world is the same as caring for ourselves." [64]

[63] Lima, *The New Designer*, 136.

[64] Mau, *Bruce Mau: MC24: Bruce Mau's 24 Principles for Designing Massive Change in your Life and Work*, 137.

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LEVEL Material **ECONOMY**

COURSE Core Editorial Experiential Print

Minimalism as a fundamental practice

Why?
Practicing a minimalist mindset can prime students to think about their ink, paper, and energy use. Visual minimalism is a great starting point for those in graphic design who wish to explore a more sustainable practice. Whether working in print or digital, having a minimalist mindset will get students to think critically about the materials and energy used to convey their intended message.

Outcome
Students create design solutions that utilize minimal ink and material while still demonstrating creative visual problem solving.

view more resources at **shiftdeck.design**

I spent a fairly significant amount of time exploring how to introduce concepts of climate resilience at foundational levels of visual communication design pedagogy. This is one of the first Shifts to come from that.

LEVEL Complexity **ECONOMY**

COURSE Digital Editorial Experiential Print

Use carbon calculators

Why?
There are a myriad of carbon calculators available online, and learning to use one and interpret its results can help students be advocates for–and active participants in–resilient design in their future workplaces. Carbon calculators can be used to evaluate printed material, packaging, exhibition-related design, and digital or web-based applications. Getting in the habit of creating carbon footprint reports for design work means designers will always be equipped with data to help make and advocate for sustainable decisions.

Outcome
Students utilize data from carbon calculators to document their project's carbon footprint. They critically evaluate their results and make material choices for the purpose of lowering the carbon footprint.

view more resources at **shiftdeck.design**

I became aware of carbon calculators for websites earlier in my career, but there are also carbon calculators available for paper-based projects,[65] exhibitions,[66] and all manner of designed experiences.

LEVEL Material **ECONOMY**

COURSE Editorial Experiential Print

Optimize press sheets

Why?
Knowing where designers can make interventions in the print production process can help students build projects that minimize waste. A good place to start is designing the press sheet for anything that is trimmed or die-cut. Designers can make more sustainable choices in their work with awareness of production processes and the places they can use design to make sustainable interventions.

Outcome
Students plan and optimize their design to best fit on a press sheet for the purpose of generating the least amount of trim waste.

view more resources at **shiftdeck.design**

I owe a debt of gratitude to *Green Graphic Design* by Brian Dougherty[67] for this one.

[65] Paper Calculator, at https://c.environmentalpaper.org, is a great place for visual communication designers to start.

[66] Check out the STiTCH Carbon Calculator: https://stich.culturalheritage.org/carbon-calculator/

[67] Dougherty, *Green Graphic Design*, 105.

LEVEL Material **ECONOMY**

COURSE Digital Experiential

Digital sustainability

Why?
It is often thought that designing sustainable visual communications can be as simple as not printing. However, our digital artifacts require massive amounts of energy to exist. Understanding best practices for reducing energy use online can put less strain on servers, ultimately requiring far less fossil-fueled energy to exist. As more companies strive for carbon neutrality, digital sustainability practices are great skill sets to possess. Educators can help students optimize their file sizes so they aren't using unnecessarily large files on the web, and can discuss best practices for color palettes.

Outcome
Students optimize image file sizes for various screens and resolutions. Students implement color palettes online that use less energy to display.

view more resources at **shiftdeck.design**

File size optimization is a crucial skill for visual comminca-tion designers. I was lucky to have spent much of my BFA in photography courses, where file size optimization and conversion are crucial to digital processes.

LEVEL Message **ECONOMY**

COURSE Context Core

Utilize timeless aesthetics

Why?
Aesthetics play a large role in people's connection to design. Educators can ask students to consider factors that make design feel timeless, versus what makes design feel trendy. Trendy designs that quickly became culturally irrelevant will necessitate frequent redesign, which require material and energy to complete. Visual communication designs that embody timelessness are less likely to necessitate redesign. Combined with other sustainable practices, timeless visuals can help lower the environmental footprint of design.

Outcome
Students engage in critical and thoughtful discourse around the factors that make design feel timeless.

view more resources at **shiftdeck.design**

I like thinking about this because it goes so much deeper than just the visual aesthetics of a piece. An educator could have some really interesting conversations around what makes something "timeless," and do timeless designs actually have more longevity than trendy ones?

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ENGAGEMENT WITH POLICY

Objective: Students will recognize relationships between design and policy, and advocate for and support environmental and climate policy through design. They will assess how their design practice can align with civic, cultural, and environmental climate goals.

LEVEL Critical Inquiry **ENGAGEMENT WITH POLICY**

COURSE Context Digital Editorial Experiential Print Research

Align with sustainable development goals

Why?
Governmental bodies (some of them) are making pledges to support initiatives of sustainability and climate resilience. Being ignorant of these goals is not in a designer's best interest, especially as more and more companies and cities are aligning their environmental policy with the UN's Sustainable Development Goals (SDGs). Besides being noble goals for a healthy planet, the SDGs are rich sources of environmental data. Aligning design projects with the SDGs help students become aware of global goals for climate resilience, and begin to see their own practice as one that can support these goals.

Outcome
Students analyze the UN's Sustainable Development Goals, and determine how their design project can align with them.

view more resources at **shiftdeck.design**

The SDGs[68] are a great blueprint for what needs to be done for us to thrive on this planet.

[68] United Nations Department of Economic and Social Affairs, Sustainable Development. "The 17 Goals | Sustainable Development"

LEVEL Content **ENGAGEMENT WITH POLICY**

COURSE Core Editorial

Use climate resilient copy

Why?
While students may not be actively engaging with the text or utilizing the information to support a design project goal, using climate resilient policy as body copy for design and typography projects brings these ideas to a student's attention. Requiring students to thoughtfully incorporate these texts into a layout exposes them to both climate resilient policy and goals and the knowledge that governmental bodies–somewhere–are working towards these goals. Inspiration could be drawn from local climate policy or the UN's 17 Sustainable Development Goals.

Outcome
Utilizing text from climate resilient policy or goals, students present judicial use of typographical concepts to create an engaging and informative page layout. Attention is paid to hierarchy, contrast, balance, and alignment.

view more resources at **shiftdeck.design**

The concept of using climate resilient copy for student assignments came up a lot in my interviews. Professors will often use "dummy text" that they feel might benefit their students–like laying out works of classic literature, or laying out the periodic table of elements.

LEVEL Message **ENGAGEMENT WITH POLICY**

COURSE Core Digital Editorial Experiential Print

Advocate for climate policy

Why?
Being aware of local sustainability and climate policies–and supporting them–can help the initiatives gain the support and momentum they need to help communities meet their goals. Students can become familiar with the climate policies (or lack thereof) of their school, city, or state. They can identify and visualize areas for improvement, or feature a goal that resonates with them, then use their visual communication skills to educate their community or advocate for policy.

Outcome
Students identify the policies of a chosen institution, and design a visual aid to effectively convey the urgency, necessity, or participation required to work towards these initiatives.

view more resources at **shiftdeck.design**

I am still not positive if this belongs here in the Engagement with Policy Mindset or over in the Hyper-Localization Mindset. It's important for everyone to have a voice in the climate resilient policies of their workplaces, schools, and local governments.

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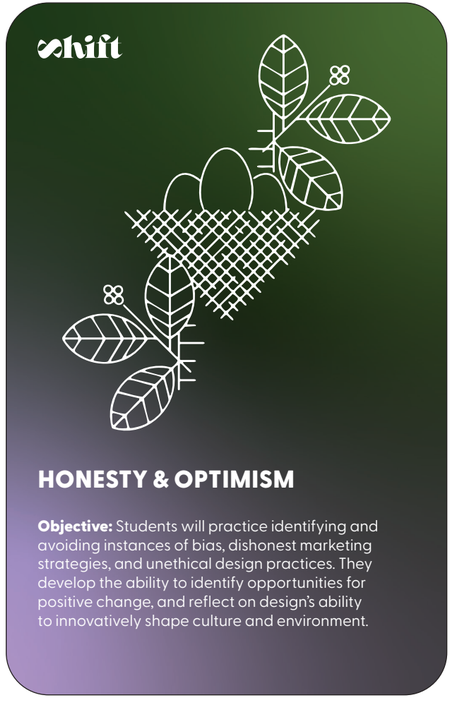

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LEVEL Critical Inquiry **HONESTY & OPTIMISM**

COURSE Context Core Digital Editorial

Identify bias and misinformation

Why?
In a time of climate disasters, technological advancements, and worsening political divides, it's necessary for students of design to have a healthy practice of identifying misinformation and bias. Designers are responsible for the messages they convey and the language they use, and must know how to avoid creating instances of misinformation and disinformation. Educators can give students opportunities to review examples of dishonest, biased, and misleading design, and make sure their students are aware of questionable marketing strategies like greenwashing and deceptive patterns.

Outcome
Students critically analyze design for misinformation and bias, and identify methods for transparency and honesty in their own design practice.

view more resources at **shiftdeck.design**

A critical life skill for everyone everywhere who might be living on this planet, and voting in elections, and working at companies, and learning in schools.

LEVEL Critical Inquiry **HONESTY & OPTIMISM**

COURSE Context Editorial

Call out greenwashing

Why?
In order to build a more resilient future, we have to learn from the past. There are myriad examples of corporate greenwashing and climate disinformation in recent years. Students should be mindful of the language they use, the visuals they choose to feature, and vague or misleading claims.

Outcome
Students critically analyze historical and contemporary examples of greenwashing, and understand how to identify greenwashing in contemporary work and avoid it in their own.

view more resources at **shiftdeck.design**

Greenwashing is everywhere.

LEVEL Message **HONESTY & OPTIMISM**

COURSE Context Core Digital Editorial Print

Persuade with optimism

Why?
Research shows that feelings like doom, fear, and helplessness have a negative effect on the brain–these feelings fail to motivate us to action, and stymie the creative process. When designing communications around climate resilience, students will have much more success if they promote a positive vision of the future rather than feature negative statistics and imagery. Maintaining an optimistic mindset will produce more innovative design for climate resilience.

Outcome
Students utilize optimistic messaging and positive visions of the future when communicating messages of climate resilience.

view more resources at **shiftdeck.design**

"Are you shaming yourself into climate action? How can you start inspiring yourself instead?"[69]

[69] Gennari, "The Climate Optimist Master Class."

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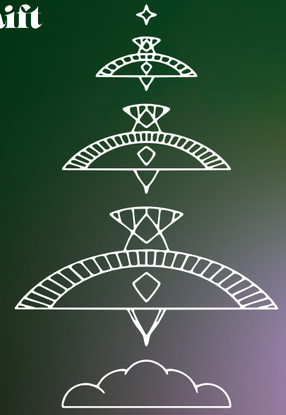

HYPER-LOCALIZATION

Objective: Students understand that the biggest impact they can make in climate resilience is in their immediate community, and are familiar with the local environment, culture, indigenous practices, waste management, and supply chain. Living sustainably during climate change will require adaptations to particular places and ways of being that may not scale or travel well.

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LEVEL Complexity **HYPER-LOCALIZATION**

COURSE Context Digital Experiential Research

Create ecosystem personas

Why?
Considering the natural ecosystem as a participant in design is a critical step towards building climate resilience into our design strategies. If we design packaging/ apps/toys/social networks without thought to the natural environment they will be experienced in, we lose critical opportunities to build something that will have a positive impact on its immediate locality. Creating a persona for an ecosystem is similar to a traditional persona, but requires more grounding in fact. Like users, ecosystems have characteristics, needs, challenges, and desires.

Outcome
Students will choose credible, relevant research sources to support the development of a persona for a local ecosystem, and use these sources to articulate an ecosystem's needs and challenges. Students can evaluate how design decisions will affect the ecosystem.

view more resources at **shiftdeck.design**

This Shift evolved from the extensive initial research I completed on nonhuman design tools. Tomlinson's work on ecosystemas is worth reading.[70]

[70] Tomlinson et al., "Ecosystemas: Representing Ecosystem Impacts in Design."

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LEVEL Complexity **HYPER-LOCALIZATION**

COURSE Experiential Print Research

Get to know local waste management methods

Why?
Waste management and recycling policies vary greatly by municipality. Many companies take it upon themselves to declare whether their product can be recycled or composted, but in reality it depends on the facilities available where the product is disposed of. Being a responsible designer, and aiding in the development of climate resilience, means being aware of variation inherent in waste management and designing for the most effective disposal possible. Students research and analyze their community's waste management policies, and apply their findings to their design projects.

Outcome
Students present research into local waste management policies and apply that research to a project's end-of-life plan, or visualize it.

view more resources at **shiftdeck.design**

LEVEL Material **HYPER-LOCALIZATION**

COURSE Core Experiential

Embrace ephemerality

Why?
Visual communicating doesn't always have to happen on paper or a screen. Students engage in critical analysis of designed message delivery that has minimal effect on the environment–for example, by stamping a typeface into sand, or writing a message on the ground with chalk. Students can consider how ephemeral presentation and performance contributes to a stronger, memorable, sustainable message.

Outcome
Students research alternative methods of message delivery beyond print and screen, and experiment with ephemeral messaging to limit design's impact on the local environment.

view more resources at **shiftdeck.design**

LEVEL Message **HYPER-LOCALIZATION**

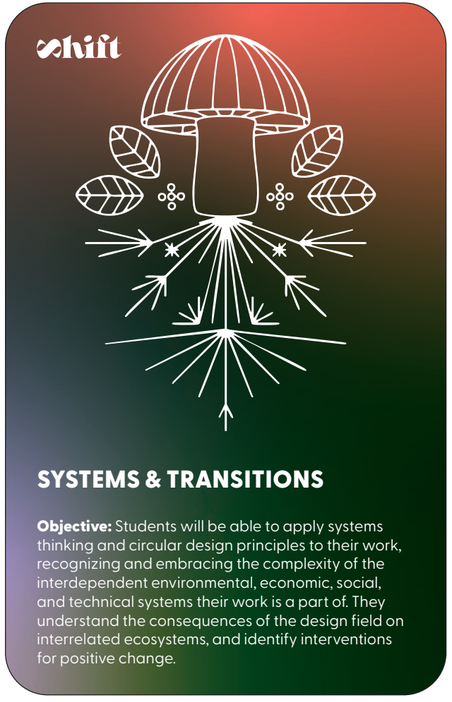
COURSE Core Digital Editorial Experiential Print

Look for local projects

Why?
Educators and their students can meet the needs of their community by partnering with local small businesses and non-profit organizations who are in need of design. Educators can encourage students to draw inspiration from local culture and environment to create designed solutions that embody a hyper-local mindset. Communities can build resilience by building economic, cultural, and social connections across disciplines and generations.

Outcome
Students partner with local small businesses and nonprofits to fulfill design requirements with work that is relevant and centered around local needs and culture.

view more resources at **shiftdeck.design**



This Shift was inspired by my work with San José's Climate Art Program. We had the opportunity to tour the city's Material Recovery Facility[71] and learn how all of our waste was sorted and managed.

"[Ephemeral packaging] is designed to last as long as necessary and not much longer. Ephemeral packaging fits comfortably into universally available cycles of recycling and regeneration by way of composting."[72] I think ephemerality can be applied to both message and material.

Making our local communities stronger is a great way to build climate resilience.

"Global goals are connected to local interests."[73]

[71] Seriously, it's so cool: https://www.greenwaste.com/facilities/greenwaste-san-jose-material-recovery-facility/

[72] Dougherty, *Green Graphic Design*. 83.

[73] Schwarz and Elffers; *Sustainism is the New Modernism: A Cultural Manifesto for the Sustainist Era.*

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LEVEL Complexity **SYSTEMS & TRANSITIONS**

COURSE Core Digital Experiential Print

Context is everything

Why?
Being able to see ourselves and our work as a part of a larger interconnected whole is a skill for building climate resilience. This understanding empowers students to make choices in material, messaging, and lifecycle that considers the magnitude and complexity of our existing systems. Educators can ask students to evaluate what environmental, economic, social, and technological systems their project exists within. Students may map these systems and their project's place within them as a research exercise.

Outcome
Students research and design visual representations of their project's context and define their project's orientation to the systems.

view more resources at **shiftdeck.design**

LEVEL Complexity **SYSTEMS & TRANSITIONS**

COURSE Context Research

Understand circularity

Why?
A circular economy is perhaps the most compelling climate resilient alternative to the linear economy, and a great method for creating environmental sustainability in our economic systems. Many start-ups are prioritizing circular design in their development, and knowing how to design for such an economy is a benefit to students and to the environment. Circular design prioritizes keeping materials in useful circulation, rather than sending material to waste after its useful life is through. Our current economy follows a linear pattern of take/make/waste, which leads to over extraction of resources, overproduction of goods, and environmental harm.

Outcome
Students define the principles of circularity, including reducing waste; designing for reuse, repair, and recycling; and prioritizing regenerative systems. Students can define the differences between a circular and a linear economy.

view more resources at **shiftdeck.design**

LEVEL Critical Inquiry Message **SYSTEMS & TRANSITIONS**

COURSE Context Experiential Print Research

Map circular lifecycles

Why?
Nature is inherently resilient. A crucial role for visual communication designers in a climate resilient, circular economy is visualizing the lifecycle map of products designed for circularity. Being able to see what a closed-loop system looks like and how it mimics natural systems, versus a linear take-make-waste system, is beneficial for concerned consumers and interested stakeholders. When assigning a project about designing a network diagram or data visualization, educators could consider introducing the concept of a circular lifecycle and allow students to use this as inspiration for their project.

Outcome
Students utilize hierarchy, balance, and color to create a circular lifecycle diagram for their designed materials.

view more resources at **shiftdeck.design**

LEVEL Critical Inquiry **SYSTEMS & TRANSITIONS**

COURSE Core Context Digital Editorial Experiential Print

Think upstream

Why?
Everything we create–every book, every digital artifact, every package–can trace its source to materials extracted from the natural environment. We are getting better at considering where our waste goes, but are not as adept at looking upstream to where materials come from–a lot of this is due to opaque marketing and complex supply chains. Educators can encourage students to think about their design in terms of material extraction. Forests, mines, data centers, and manufacturers all extract resources and require massive amounts of physical space and labor. A little bit of research can shed light on the real source of our designed materials.

Outcome
Students research where the materials, physical space, and labor that support the elements of a design project come from. They implement this research to make design decisions that promote climate resilience and sustainability.

view more resources at **shiftdeck.design**

"Natural, social, economic, and technical systems come together in design."[74]

"Waste equals food."[75]

Graphic design students could do some amazing data visualization work with circular lifecycle maps.

This is also an opportunity for design students to flex their skills. Students could create a diagram of material sources.

[74] Faludi et al., "Sustainability in the Future of Design Education."

[75] Braungart and McDonough. *Cradle-to-Cradle*. 92.

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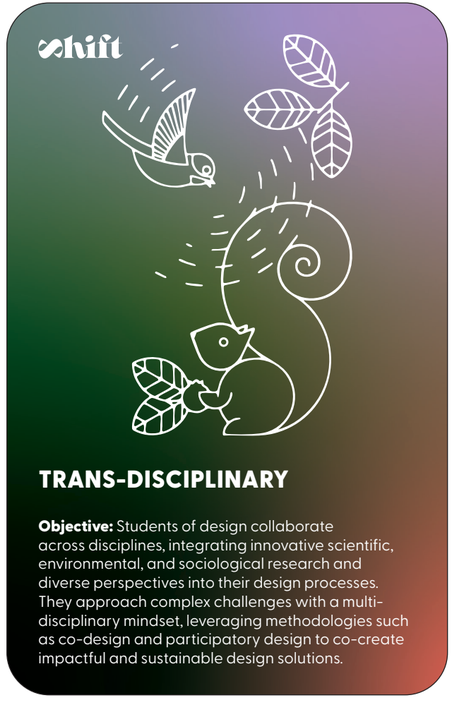

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LEVEL Message **TRANS-DISCIPLINARY**

COURSE Core Digital Editorial

Encourage interdisciplinary collaboration

Why?
Being well-versed in data visualization can help students understand the complex factors contributing to climate change. Designers of the future will need to collaborate with environmental scientists, engineers, and anthropologists to affect change. Getting design students accustomed to working with those in other fields is a crucial step towards transdisciplinarity, which is a crucial part of solving large-scale problems. Rather than source data themselves, designers can collaborate with students from a scientific discipline to design an infographic or data visualization based on the study of the science student. Groups collaborate to ensure the visuals are an accurate and engaging representation of the data.

Outcome
Students develop interdisciplinary collaboration skills by working directly with peers in other disciplines to transform complex data into clear, engaging visual narratives that enhance the viewer's understanding of critical issues.

view more resources at **shiftdeck.design**

LEVEL Critical Inquiry **TRANS-DISCIPLINARY**

COURSE Digital Editorial Experiential Research

Identify tertiary participants

Why?
Students look beyond primary and secondary users and stakeholders to consider all human participants in a design, identifying participants as people who inhabit the communities and support the supply chain within the context of a design. Students understand the human labor and exploitation necessary to extract resources and create material as an unintended consequence of design. Broadening our definition of "participant" to include these overlooked populations will be a large step towards building climate resilient methods into design culture.

Outcome
Students will identify and justify tertiary human participants in the context of their design project.

view more resources at **shiftdeck.design**

LEVEL Message **TRANS-DISCIPLINARY**

COURSE Core Experiential Print Research

Interview an expert

Why?
Collaboration and ecological literacy are essential skills for climate resilience. Design students can get used to conducting research and understanding the needs of those from other disciplines by conducting expert interviews in the research phase of a project. Students could contact an expert in local ecology, culture, or indigenous practice and conduct an interview to learn about the needs of their local community and environment. Designing with this kind of data adds a depth to design work that is deeply valuable to a sustainable future.

Outcome
Students develop design-driven research questions and identify and interview an expert in local ecology, culture, or indigenous practice. Students document and synthesize information from the interview into their design process.

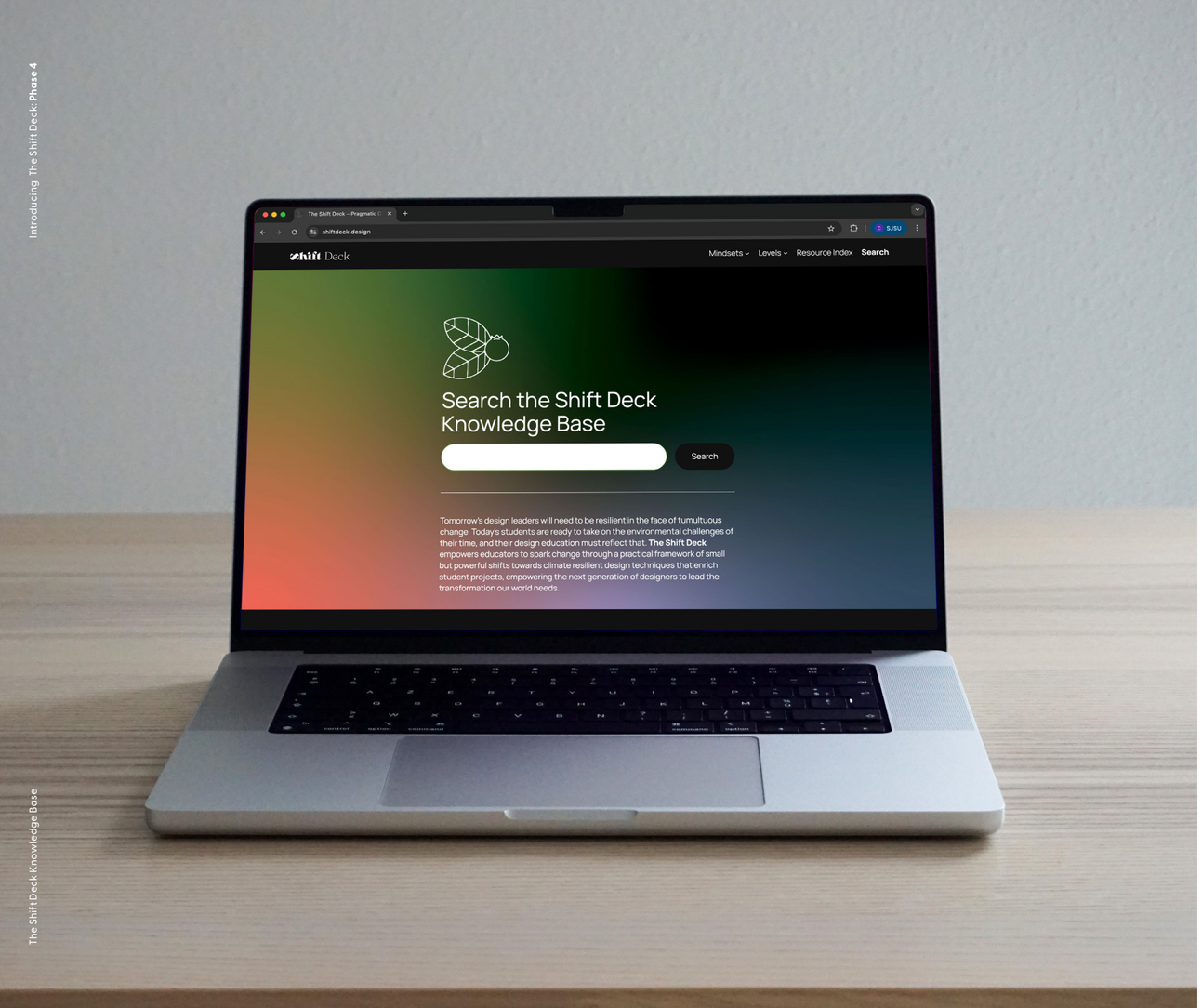
view more resources at **shiftdeck.design**

"*...environmental issues are complex and cannot be understood through a single discipline or department.* Despite a decade or more of discussion and experimentation, interdisciplinary education remains an unfulfilled promise."[76]

Tertiary participants should be an absolutely crucial part of any design process that wishes to do no harm.

Interviewing experts has been one of the most enjoyable parts of my research for the Shift Deck.

[76] Orr, *Ecological Literacy*, 90.



THE SHIFT DECK KNOWLEDGE BASE

Origins

From the early stages of development, I envisioned the deck having an accompanying online presence—whether for distribution, extended learning, or as a centralized resource hub. While the creation and refinement of the physical deck remained my primary focus, user testing revealed a strong desire for a shared space where resources, methods, and insights could be exchanged. Many users also expressed interest in deeper learning about climate resilience, particularly as it relates to the Shifts represented in the deck.

Organization

The homepage of the Knowledge Base features a search bar as its central interface. Given the deck's current iteration, I designed the site under the assumption that users would consult it after encountering the physical deck. The search function returns an extensive list of curated resources, organized by Mindset, Level, and Course.
The main navigation allows users to browse content by Mindset. Selecting a Mindset leads to an explanatory page detailing both the Learning Objective and its associated biological strategy, along with a list of all related Shifts. Each Shift page includes the full text of the corresponding physical card, as well as an organized list of relevant resources. Additional sorting and browsing options are available by Level and Course. Users also have the option of downloading the entire deck in PDF format.

Content

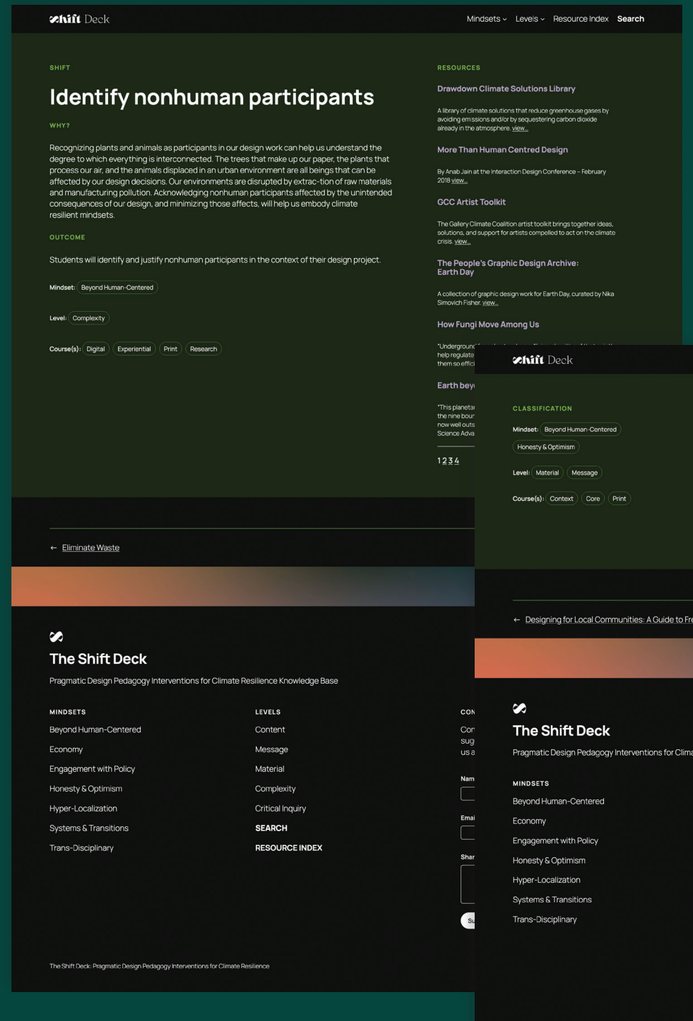
Right now, the Knowledge Base is exactly that—a repository of organized knowledge. As it exists right now, everything on the website will have to be consistently reviewed, updated, and added-to in order to remain relevant. I've included numerous resources from my research, organized by Mindset. I have plans to expand to include links to books I have read as well. I've also included items I would consider to be more in the realm of "inspiration" than "resources," but I think those are just as important for educators and designers to see.

Community

While the current iteration of the website functions primarily as an informational tool, it also lays the foundation for a broader community. At present, visitors may contact me through a simple message form on the site. However, I hope to grow this into a more robust community space—potentially through a platform like Slack or another accessible, no-cost digital forum. This aspect of the project is a priority as I continue to expand both the deck and its associated research.

THE SHIFT DECK KNOWLEDGE BASE SCREEN-SHOTS

The Shift Deck Knowledge Base can be accessed online at:
https://shiftdeck.design

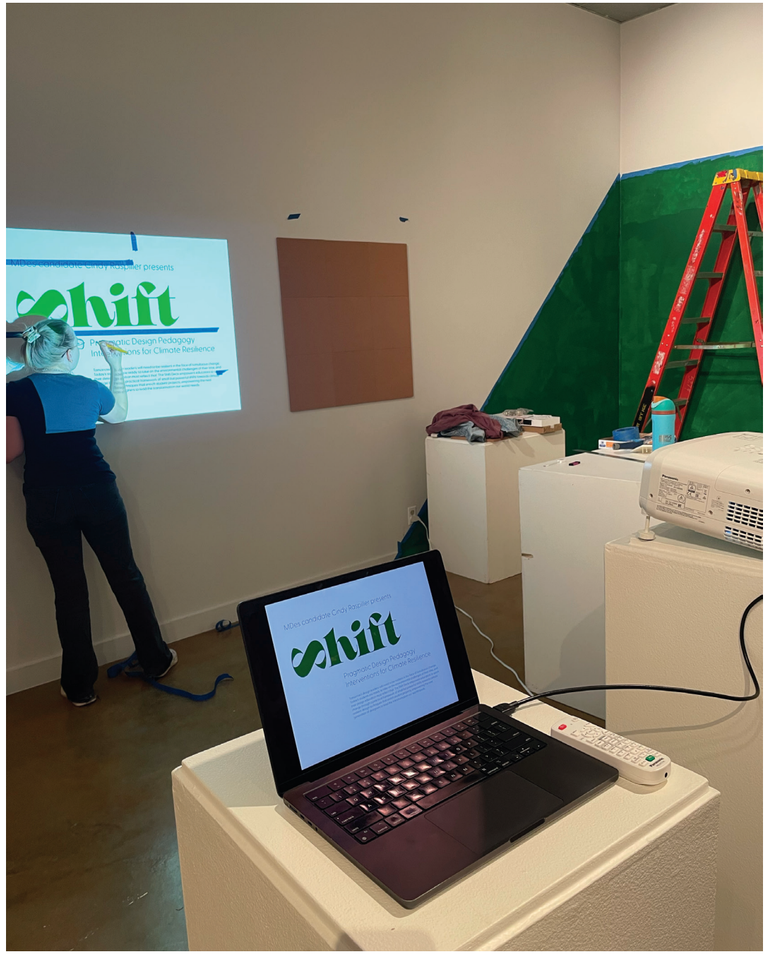


Left: The page for the Beyond Human-Centered Mindset. You can read the Objective, Biological Strategy, and all associated Shifts.

Right: The page for the Shift Identify nonhuman participants, overlapped by a page showing a resource related to that Shift.

Introducing The Shift Deck, Phase 4

MDes Thesis Exhibition



MDES THESIS EXHIBITION

XD: The 2025 Master of Design Thesis Exhibition

May 5–9, 2025
Natalie and James Thompson Art Gallery
San José State University

My thesis exhibition marked the first formal opportunity to share my completed thesis project with the public. I approached this as an opportunity to encourage engagement with climate-resilient visual communication design methodologies through a variety of touchpoints.

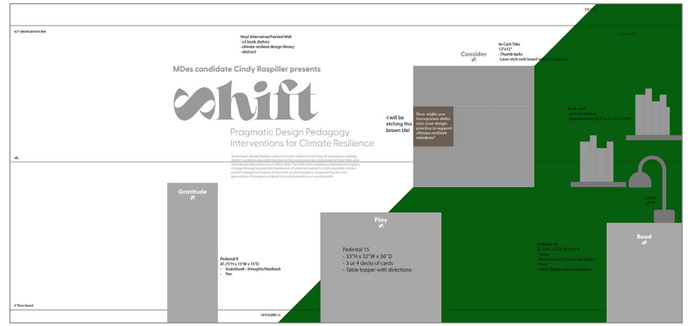
Read

One of the earliest concepts for the exhibition was to pay tribute to my initial research poster, created for the SJSU/Adobe Experiential Horizons event in October 2023. At that stage, only two months into my graduate studies, I struggled with how to visually represent a research project that had not yet fully materialized. My most tangible progress was a growing stack of books. A professor recommended that I talk about the books I was reading in my poster design to encourage discussion around them with attendees. This suggestion guided the visual direction for that poster.

Three semesters later, I presented some of these books in their physical form in my final thesis project exhibition. Selected books were displayed on bookshelves accompanied by a placard encouraging viewers to read them. I was gratified to see that my literature review still served as a way to connect with people.

Explore

Displaying The Shift Deck was a necessary part of a successful exhibition of my thesis project. I arranged five complete decks on a large, low pedestal, accompanied by placards inviting visitors to “explore.” To facilitate interaction, I disassembled two decks and arranged their cards alongside an upright instruction booklet, allowing

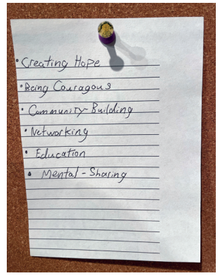


Left, clockwise: Collating the Shift Deck cards and instructions after receiving them from the printer.

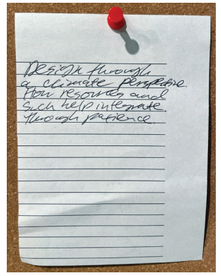
Tracing my exhibition’s title and introduction onto the gallery wall.

Applying the first coat of green paint onto the gallery wall.

Right: Elevation plans for my project’s corner of the gallery space. The size of the green wall space was altered due to the height of the ceiling.



"Creating hope, being courageous, community building, networking, education, mental-sharing"



"Design through a climate perspective. How resources and such help integrate through patience."

participants to browse freely and reduce any hesitation around touching an exhibited item. The remaining three decks were left intact–bundled with rubber bands–to represent the final packaged form.

Mindsets

To introduce and contextualize the framework of "Mindsets," I designed a series of seven 18" x 24" posters. Each poster featured a Mindset along with its associated graphic, learning objective, and biological strategy. These visual summaries provided a cohesive overview of the pedagogical and ecological underpinnings of the project.

Share

This is the part of the exhibition where I would ask participants to consider how my research might affect their design practice. I mounted a 3' x 3' cork board onto my exhibition wall. I used a laser engraving tool to engrave the question, "How might you incorporate shifts into your design practice to support climate resilient mindsets?" into the middle cork tile. I supplied thumb tacks, scrap paper, and pens for participants to write responses and share them on the wall.

This component of the exhibition invited audience reflection and contribution. I installed a 3' x 3' cork board on the exhibition wall as a space for visitors to share thoughts. The central tile featured a laser-engraved prompt: How might you incorporate shifts into your design practice to support climate-resilient mindsets? Participants were encouraged to respond using the provided paper scraps, pens, and thumb tacks, contributing their reflections to a dialogue around the exhibition's themes.

Left: The final setup of *Shift*, my MDes Thesis Exhibition, plus two comments left by opening night attendees. Four areas allow visitors to interact with climate-resilient methods and pedagogy in different ways.

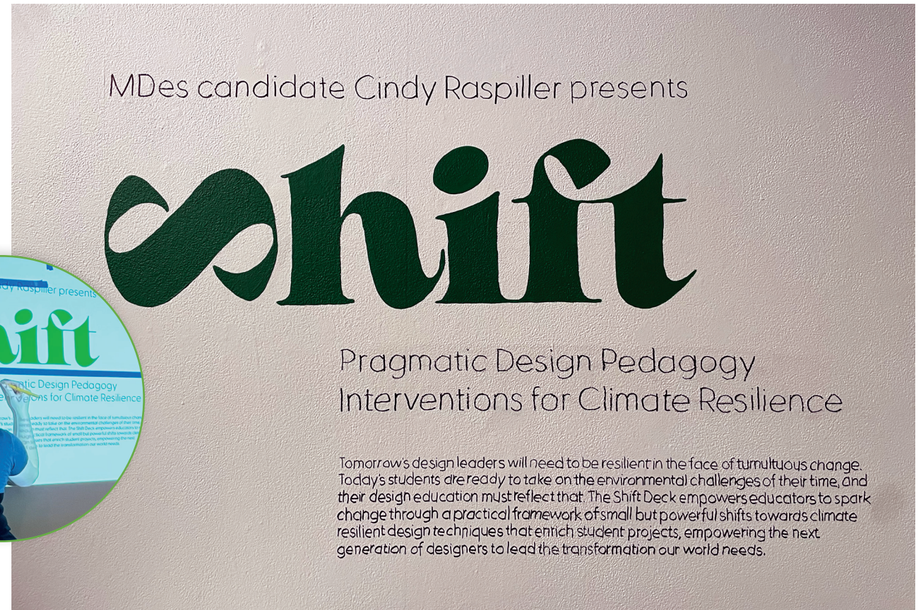
Alternative to vinyl wall decals

I could not, in good conscience, use vinyl wall decals for an exhibition on climate resilience. The PVC plastics that wall decals are typically made of generates a lot of waste and do not biodegrade–meaning those decals will live on forever in whatever landfill or ocean they end up in. I chose to paint my title and descriptive paragraph onto the wall using no-VOC paint and Posca pens for the detailed smaller text. I projected my "decal" onto the wall using my laptop and a standard projector, and then traced over the projection with my paint and paint pens.

While this worked great for my exhibition, it is not always a viable option for larger exhibitions. There are other options out there, such as stick-on paper decals and fabric. Recyclable PVC-alternative plastics are out there, but I found them prohibitively expensive for my purposes.

Almost all the remaining components of my exhibition were either used or came from my home. I purchased the frames for my poster from a local frame shop, and donated the ones I would not use in my home to the gallery after the show.

If you have a few hours to spare, a steady hand, and a nice flat wall, this could be a great alternative to vinyl lettering.



CONCLUSION

Visual communication design shapes how we see the world. Our experiences are increasingly mediated through designed digital interfaces, our tastes and desires dictated by designed media, our cultural values defined by designed messages. These digital experiences are not immaterial. They live in massive server farms, taking up space and natural resources. When we *do* design for print, the final product is usually destined for the landfill.

This is unsustainable. Visual communication design is not the only field operating within a sustainable system, but it is nevertheless complicit in the environmental challenges that define our era. Numerous disciplines are engaging with sustainability and climate resilience; these concepts need to make their way into design education–into the foundations that we are taught, and embedded into every project we are a part of–so that students go into the field embodying climate resilient design.

These Shifts are transitional, meant to fill a gap between traditional pedagogical approaches and emergent sustainable practices while climate-resilient projects are developed and adopted and the role of a visual communication designer continues to expand and evolve. I would love to turn this into a series of projects and courses to meet the moment, when that moment comes. Each Shift is a rich vein of climate resilient methodology to mine, and each could possibly exist as its own thesis project. Future research into climate resilient visual communication design methodology could elaborate on Shifts, expand upon the Five Levels of Sustainability in Design Pedagogy, or further develop The 7 Mindsets of Climate Resilient Designers. The Shifts could also be adapted to other realms of design; I could see the Mindsets and Shifts being applied to fashion design, interior design, and product design.

As my educational career blossoms, I intend to embed these Shifts within my own pedagogy, ultimately structuring an academic course around them. I envision real-world case studies wherein educators implement the Shifts, allowing for iterative refinement based on pedagogical outcomes and contextual feedback. Many of the educators I worked with throughout my research and co-design process were attracted to my research because they were already interested in sustainability and climate resilience. Future phases of this work will focus on reaching those for whom climate resilience is not yet a priority, adapting strategies to suit their pedagogies and institutional constraints. Publishing this research would facilitate wider dissemination and dialogue. I'm also partnering with Climate Designers, an organization dedicated to helping designers see themselves as climate leaders, as a research strategist to support development and strategic research into climate-resilient design pedagogy.

As the role of visual communication evolves with technological advances, we must be even more vigilant to include climate-resilient practices in our work. Artificial intelligence is trained on data that is filled with human bias, and cannot speak of living ecosystems or species through the lens of anything other than human experience. To build a design pedagogy that is climate resilient–to build design practices that strengthen our communities, heal our ecosystems, and provide blueprints for a better future–we have to look to solutions and methods that reach beyond human-centered thinking. To de-center the human in the design process is to acknowledge that the welfare of humanity depends on the welfare of all life on Earth.

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Nothing great is ever accomplished alone.

My thesis committee is an amazing group of thoughtful, knowledgeable design educators who care deeply about their students. I want to express my gratitude for my thesis advisor Marjan Khatibi, for jumping into this work with me and for her enthusiasm, motivation, and patience, even when my own was lacking. I want to express my sincere thanks to Andrea English for always bringing me back to what matters the most, to Connie Hwang for her mentorship in graphic design education and her keen eye, and to Mara Holt Skov for being a model of dedication to one's craft. My growth as a designer and educator during my time at SJSU is due in large part to the guidance and insight of this committee.

I would also like to acknowledge and thank the many professors who have shaped my graduate education: Josh Nelson, Yoon Chung Han, Sarah Mills, Chang Kim, Dana Ragouzeos, and Diane Elabidi. Words cannot fully express my gratitude—I have learned so much from each of you.

I could not have accomplished any of this without my family. I'm grateful for my husband and my mother, for being constant wells of support and encouragement and for always giving me precious time. To my daughter, thank you for being a daily source of strength, joy, and laughter. I want to thank all of my family and friends, near and far, for your patience, your ear, your willingness to participate in research, your encouragement, your coffee dates, your advice, your spare room, your book recommendations. And I want to thank Eiichi Nishino, Miho Okada-Nishino, and Cedric Walker for the recommendations that got me here in the first place.

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Hugh Dubberly is a giant in the design industry - designing for Apple, and designing the first internet browser, Netscape. He has taught design courses at major design schools across the country. Paul Pangaro is a professor at the American Society for Cybernetics. This article was published "on behalf of Tongji University" in the journal *She Ji: The Journal of Design, Economics, and Innovation*. The particular issue this article was published in was a special one, focusing on the efforts of the international group: The Future of Design Education. Published in 2023, this is an answer to the rising concerns that design education does not effectively prepare students for the complexity of the world their work will exist in.

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Dan Hill is a designer and urbanist, and has held many positions of design leadership. Strategic design is about using traditional design methods and applying them to "big picture" problems; this book serves as an argument that designers need to use strategic design to tackle those problems through the organizations they are a part of. Hill advocates for designers to use this new vocabulary to reorient the direction of design culture and advocate for change towards better futures.

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Manuel Lima is a designer, lecturer, and author; he is known for his information design and writings on design culture. He's written three bestselling books on information design patterns and culture. In The New Designer, Lima outlines nine "myths" of the design industry. After discussing each myth, he provides actionable advice for designers to move past these myths in their own work. I focused specifically on the myth, "Design is for humans." In this chapter, he highlights a few reasons why design has not yet fully stepped up to the task of moving from human-centered to earth-centered. He says that humans are not hard-wired to care about the long-term future, that data points are not compelling though for us to act, that businesses do not yet profit off of sustainability, and notes we have a false assumption that "digital will save us." In his "Actionable Advice" section, he notes that designers should practice being a voice for the natural world as much as they are a voice for the user, as well as practice extending a product's lifecycle so that we consider "the environment as your ultimate stakeholder."

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Damien Lutz is a UX designer and researcher out of Australia. He has also authored the books *Future Scouting* and *The Life-Centred Design Guide*. His book is self-funded. He is generally regarded as an influential voice in planet-/green-/climate-/earth-centered design circles. When I first read this book, I was in the midst of writing a paper about the very same topic, and was dismayed that the information on nonhuman personas had already been so thoroughly compiled. But now, I suppose it's one less thing for me to work on. Lutz brings some interesting new thoughts to the nonhuman persona scene, such as considering whether you are designing to respect or designing to engage. Like his Life-Centered guide, this book is a rich trove of resources for me to mine in my own research.

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This book does a number of things broadly. First, it acts as an overview of whose voices are currently loudest in the climate-centered design movement, and talks about what they are saying and why. This is a good jumping-off point for further research on my proposed topic. Second, Lutz has created a number of frameworks to help think broadly about how your design affects more than just people. Third, it explores other realms of design thinking that overlap with his Life-Centered design methods. This guide was written for designers, service designers, business decision makers, and anyone interested in using design skills to explore transformational change in the design industry. The focus is on design thinking with the benefit of all life, and not just "the user," in mind. The author hopes to spread his message and methodology of life-centered design, so that we can help design a healthier planet.

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Sanders is a social scientist, Professor at Ohio State University, and the founder of MakeTools, LLC. Stappers is a professor of design techniques at Delft University. Convivial Toolbox is a guide for designers who co-create tools with the people who are going to use them. Generative Design Research helps people articulate their desired futures so they can design tools to help them get there. This technique of convivial design could be useful if I plan to co-create design workshops or curriculums with the students who will be benefiting from them.

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Sanders is co-author of *Convivial Toolbox*, and is considered an authority on convivial design, design education, and participatory design methods. This workshop was held at the Design Research Society conference in Brighton, UK in June of 2016. This conference was attended by over 200 members of the design education and research community. In the 90 minute workshop, six design educators shared four future design education scenarios, and a group of 40 attendees teamed up to envision what a future design curricula would look like under those scenarios. Card sorting and vision boards were presented. The future scenarios that were explored were developed by researchers in the design field and have been written about fairly extensively.

This paper was written to analyze the process and results of the workshop. The intended audience is design educators. The paper seeks to explore and present what future visions the attendees valued and why. The cards that were left out of the final presentations were analyzed just as closely as the cards that were used. The authors hope to gain insight into the future of design education, as imagined by those in the field. I found a lot of value just in learning about the 4 scenarios for the future of design education.

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Tomitsch and his research team created a framework for designing nonhuman personas based on a case study in designing smart furniture for use by both humans and animals in an urban environment. This article was instrumental in helping me understand and define the use of nonhuman personas in my own research. They advocate for using a middle-out approach to developing a coalition that can speak on behalf of the nonhuman entity throughout the design process. The extensive (and expensive) nature of creating such a coalition is what led me to experiment with using AI to create a nonhuman persona.

Tomlinson, Bill, Bonnie Nardi, Daniel Stokols, Ankita Raturi and Andrew W. Torrance. “Returning ecological wealth to nonhuman species through design: the case for ecosystemas.” *Ecology and Society* 27(2): 34. https://doi.org/10.5751/ES-13324-270234.

Tomlinson and his team developed the concept of an “ecosystema;” basically, a persona, but it represents an entire ecosystem. In addition to providing detailed examples and methodologies for creation, the researchers outlined use cases for the ecosystema that were very helpful in putting this type of tool into practice. They note that beside being used to representa an actual stakeholder, an ecosystema could be used to help guide a client towards a more sustainable outcome. It could also help a designer make connections between various clients and industries. Lastly, it could be used as a conversation towards “undesign,” an interesting concept in which the argument is made that a solution to a problem may not lie in a newly designed “thing.”
I based my AI chatbot “Ecosystema Generator” off of this research paper for my pre-proposal exploratory work.

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This book is designed and produced by Cindy Raspiller, presented in partial fulfillment of the requirements for the degree of Master of Design with a specialization in Experience Design at San José State University in San José, California.

Graphics were produced and edited in Adobe Photoshop and Illustrator, layout completed in Adobe InDesign. Typefaces include Greycliff CF by Connary Fagen and Arsenica Variable by Francesco Canovaro.

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