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Towards radical synergy for more just and equitable futures

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Towards Radical Synergy for More Just & Equitable Futures

Audrey G. Bennett, Ron B. Eglash, Roland Graf, Deepa Butoliya , Keesa V. Johnson, Jenn Low and Andréia Rocha
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Inequity and social injustice are omnipresent wicked problems, complex challenges for which there are no single solutions due to their cross-cultural, cross-disciplinary, and systemic nature. For example, the 'green revolution' of the 1970s was supposed to solve world hunger. However, we saw a rise in corporate control over agriculture (Pielke and Linner, 2019) instead. The design of social media, widely touted as creating a harmonious global village in the 1980s, has instead partly turned into hatching grounds for a global white supremacist movement and other forms of extremism. We cannot afford to allow accidental synergies to create global disasters passively. Instead, we need to bring social, technological, economic, and environmental concerns, among other considerations, into a deliberate and reflective emergent process. We refer to this decolonial, emancipatory form of design emergence as 'radical synergy.' In this paper, we begin by visualizing how radical synergy provides scaffolding for the program. Then, we show snapshots of how it took pedagogical form over the past two years, enabling graduate students and their partners to take steps toward attaining it by facilitating community-based, deep collaboration informed by anti-racism, decolonization, and integrative critical analysis, and facilitated by an integrative design thinking and making approach.

Keywords: decolonization; integrative design; generative justice; radical synergy; design emergence

Introduction

Synergy came into widespread use in the late 19th century when Henri Mazel argued that Darwinian theory failed to account for "social synergy" (1896), a collective evolutionary drive by which the masses, not the elites, created civilization. Its subsequent adoption in corporate rhetoric led to mostly colonized models: One could speak of holistic perspectives while maintaining the same exploitative and unsustainable practices. Therefore, we qualify what we mean with the phrase radical synergy. When someone describes design service-learning as if they are tossing a bone to the peasants, it is a colonized model of synergy. When we have design curricula that integrate critical perspectives (anti-racism, decolonization, feminist theory, etc.); material analysis (sustainability, political economy, labor emancipation, etc.); and democratization (participatory design, community-led design, emancipatory design, etc.), we create the possibility—though not the guarantee—for radical synergy. Radical synergy is aspirational and evolutionary, a decolonial design approach that aims to bring more voices into labs, studies, and public spaces—including voices from lay and experts, past and future, human and nonhuman participants alike. If we take our educational mission seriously, then some aspects of our design pedagogy must emerge bottom-up to include contributions from community stakeholders and the assets they bring to the collaborative design process. In this paper, we aim to tell a visual story of the pedagogical concept of radical synergy, how it scaffolds the MDes program in Integrative Design at the Penny W. Stamps School of Art and Design at the University of Michigan, and how it has manifested thus far in select student work.

Visualizing Radical Synergy Using the Tuareg Triangle

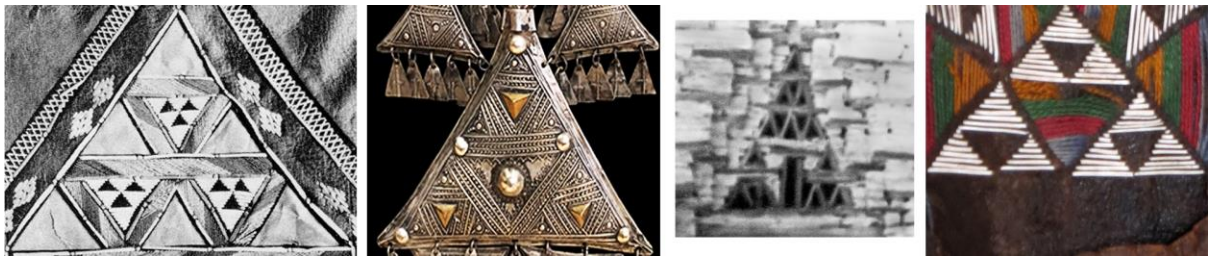


Figure 1: The Tuareg Triangle in a. cloth, b. metal, c. stone, and d. fiber. Images a and c from African Fractals; b courtesy Africa and Beyond Ethnic Art Gallery, San Diego, California; d courtesy Liuba Berti.

Our radical synergy approach counters typical formulations of innovation such as in Donald Norman's famous formulation of innovation, practices such as Human-Centered Design (HCD) are acceptable as an adjustment after the fact. However, since laypeople will only refer to what they know, significant innovation requires a technology-first approach (Norman and Verganti 2014). He uses the analogy of hill-climbing algorithms in nonlinear optimization: HCD will trap one on local minima. Norman's co-author Verganti accepts this critique but holds out the possibility that designers might use research to "create new hills" that would presumably help to incorporate lay voices.

Our radical synergy approach contests the premise that laypeople can only contribute uninformed reactions or user feedback. Instead, we invert it. We note that elite forms of knowledge-making that Norman idolizes as "true innovation" include pesticides, nuclear power plants, the fossil fuel industry, deskilling of labor from automation, media infrastructures that have facilitated white supremacist groups, and a host of other technologies inflicting wealth inequality, ecological devastation and other pains. In contrast, lay practices of Indigenous people maintained egalitarian, collaborative relationships with nonhumans and each other in ways that fostered greater biodiversity and social justice (Gowdy, 1999; Patel et al., 2012; Ignatov, 2016; Eglash, 2016). That they can be described as primitive only serves to underscore the problem of the colonial gaze.

How, then, does one recover these lost principles of just and sustainable design? Even if we can, how do we translate them without appropriation? How should those translations, assuming they are done with proper collaborative networks, enter into the innovation process, keeping in mind that we want to empower the ability to envision the new and maintain the precautionary wisdom of the past?

Patricia Hill Collins, a founding figure in Black feminism, described what she called "the outsider within": the fact that as we move across lay/elite boundaries, we always carry some part of our former identity. By extension, that former identity will have other identities nested within. The nested or 'fractal' model applies to technologies as well. Recycling a plastic bottle might add sustainability in some ways, but it can carry a molecular trace of fossil fuel origins that reemerges to sabotage the actual circular economy. Conversely, one can design for positive traces that can carry through and create synergistic benefits. One part of our formulation of radical synergy has been to develop ways of comprehending this fractal nesting as a kind of meta-design. Recognizing that there will be, for example, labor issues within sustainability issues and vice-versa requires a fractal perspective.

Thus, radical synergy functions as a nonlinear interplay of actors and activities within a multi-layered system, guided by historical consciousness of past wrongs and future visions for just and sustainable ways of life. In this paper, we experiment with its visual expression using the first three steps of what is known in the West as Sierpiński's Gasket (Mandelbrot 1983), a fractal evolution of equilateral triangles. However, if we are to decolonize our design history, this might be an excellent place to start. Sierpiński was not the first to create this fractal design. Recursive composition, in general, is an ancient tradition in many African societies, where it is often related to an egalitarian distribution of power. The triangle in the Tuareg context, shown in Figure 1 above, is often recursively composed; and has symbolic associations with female power and spirituality. We will refer to this fractal as the 'Tuareg triangle' henceforth in honor of that origin.

Figure 2 below shows the first three iterations of the Tuareg triangle at the top. Below that image, we use the third iteration to visualize the interplay of the four components of radical synergy: Deep collaboration informed by anti-racism and decolonization, integrative critical analysis, and integrative design thinking and making. We pause at the second iteration to help make this clear, but the unfolding of this as an evolutionary process, in which each component is embedded in the other, expresses the nonlinear and adaptive nature of the collaborative design approach we are describing.

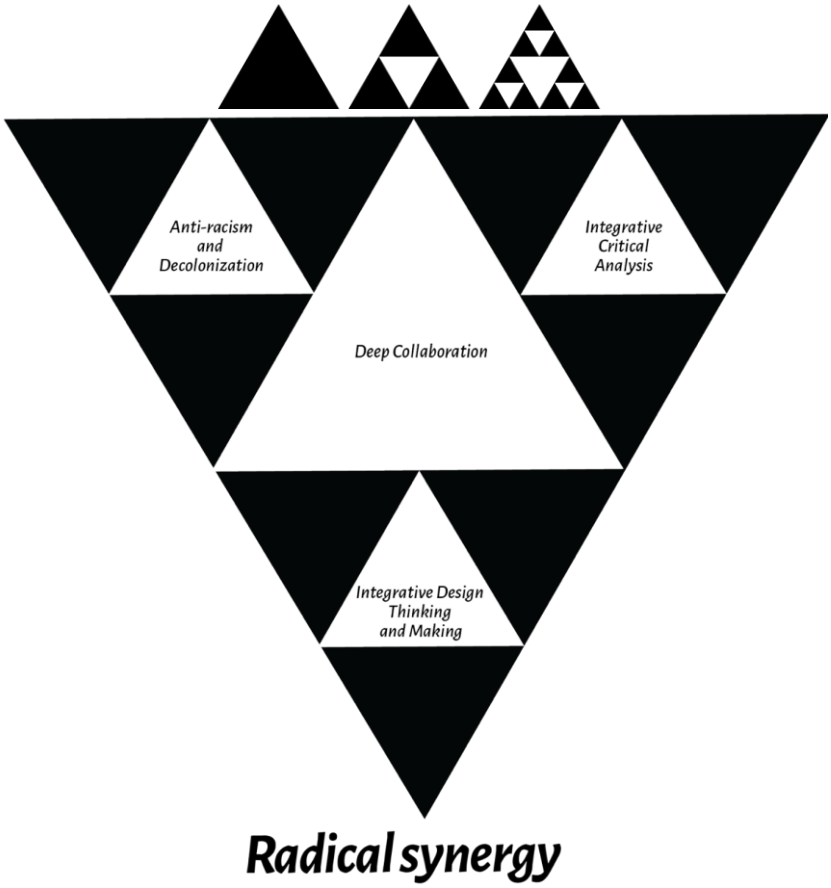
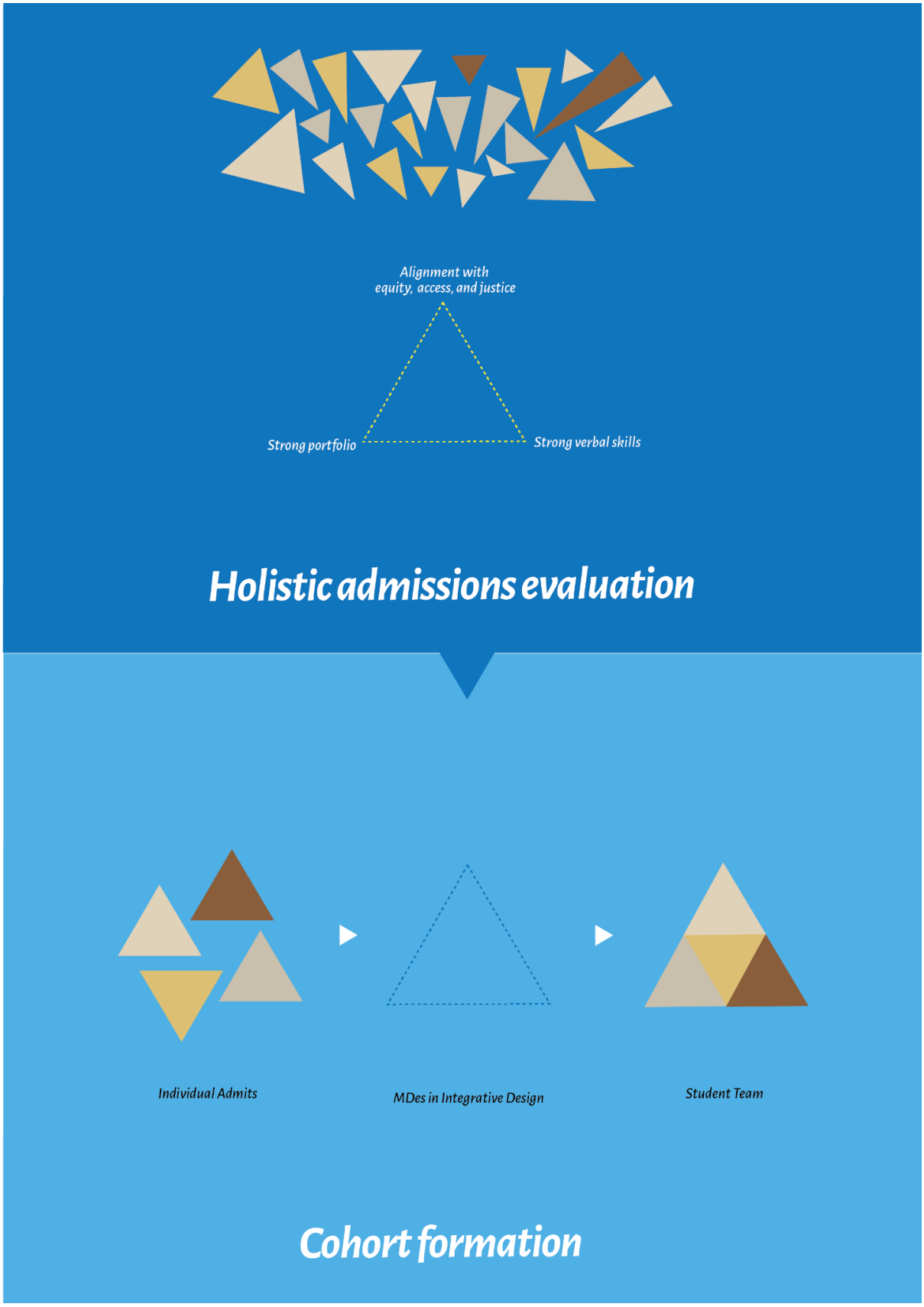
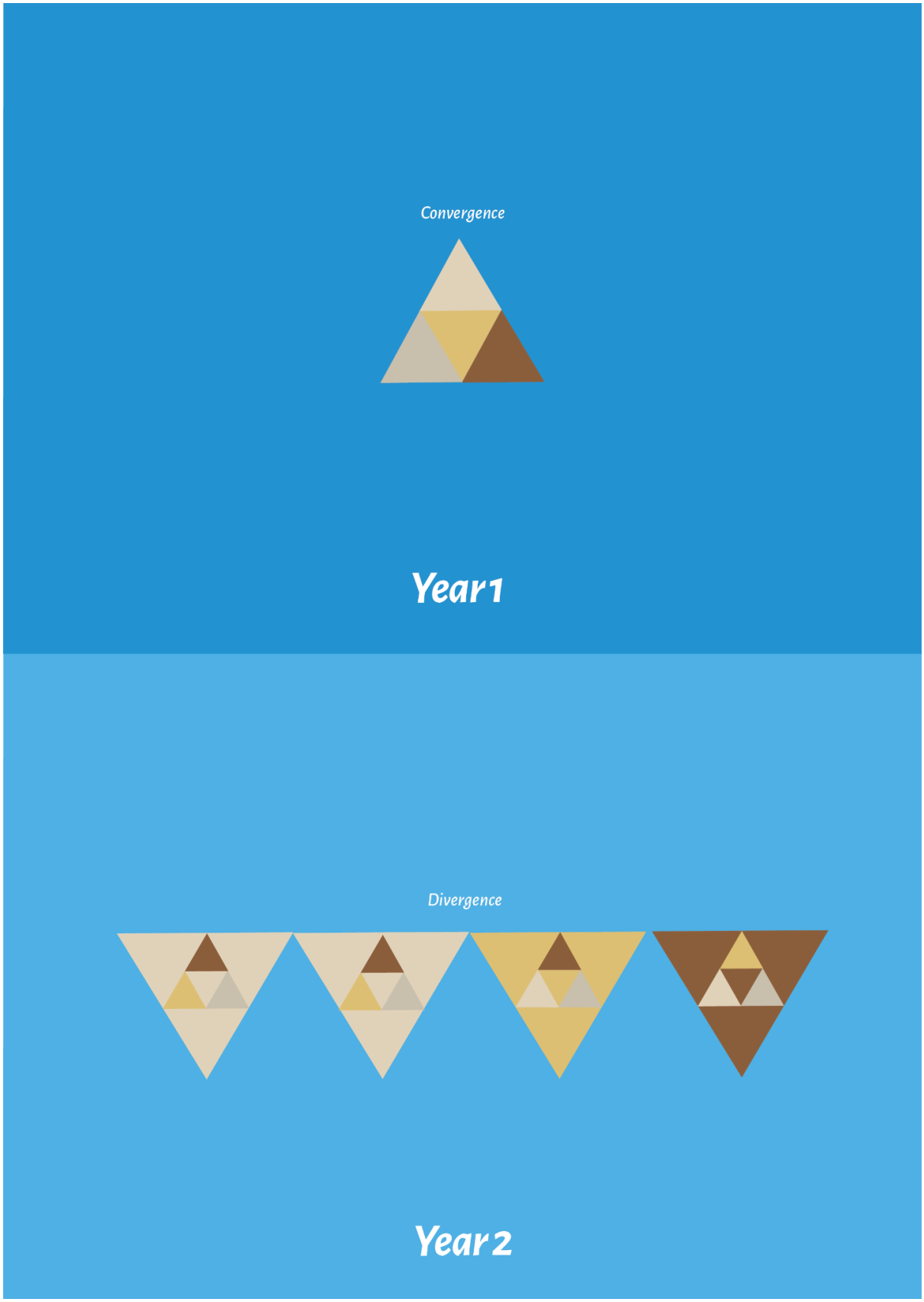


Figure 2. Top: The first three steps of the Tuareg triangle; Bottom: The third step of the Tuareg Triangle is adopted to represent the four components of radical synergy: deep collaboration informed by anti-racism and decolonization, integrative critical analysis, and integrative design thinking and making.

Tuck and Yang's famous manifesto titled "Decolonization is Not a Metaphor" points out that an all-white classroom that faithfully reads the right books is not sufficient; decolonization must first and foremost address actual Indigenous peoples, their land rights, and dispossessions. Where we draw lines and definitions in the settler-colonized-enslaved triad is complex, but facilitating interaction between student, staff, faculty, and community stakeholders to maximize Black, Indigenous, and People of Color's presence in the learning process is fundamental. For example, one of our recent publications (Eglash et al., 2020) is co-authored by Native American, African, Caribbean, and White US scholars. It describes a collaborative design process in which Indigenous knowledge is "translated" into models such as computational tools, such that there can be two-way feedback between Indigenous communities and designers. New actors come into play out of that interactive process: some of them nonhumans such as ecological elements, some hybrids of human, technological, and natural elements. The histories of colonization written into forest destruction shifted diets and tastes that accommodate fast food empires, and the replacement of communal ways of thinking and being with an ethos of competition and domination come into focus. Thus, providing students with models of design as an emergent process—one which includes the voices of colonized and dominated agents as living participants, and tools of design that can enhance collaborative envisioning, testing, error-making, forgiving, and other aspects of an emancipatory process—gets at the definition of radical synergy.

Components of Radical Synergy: Deep Collaboration




Convergence
Year1
Divergence
Year2

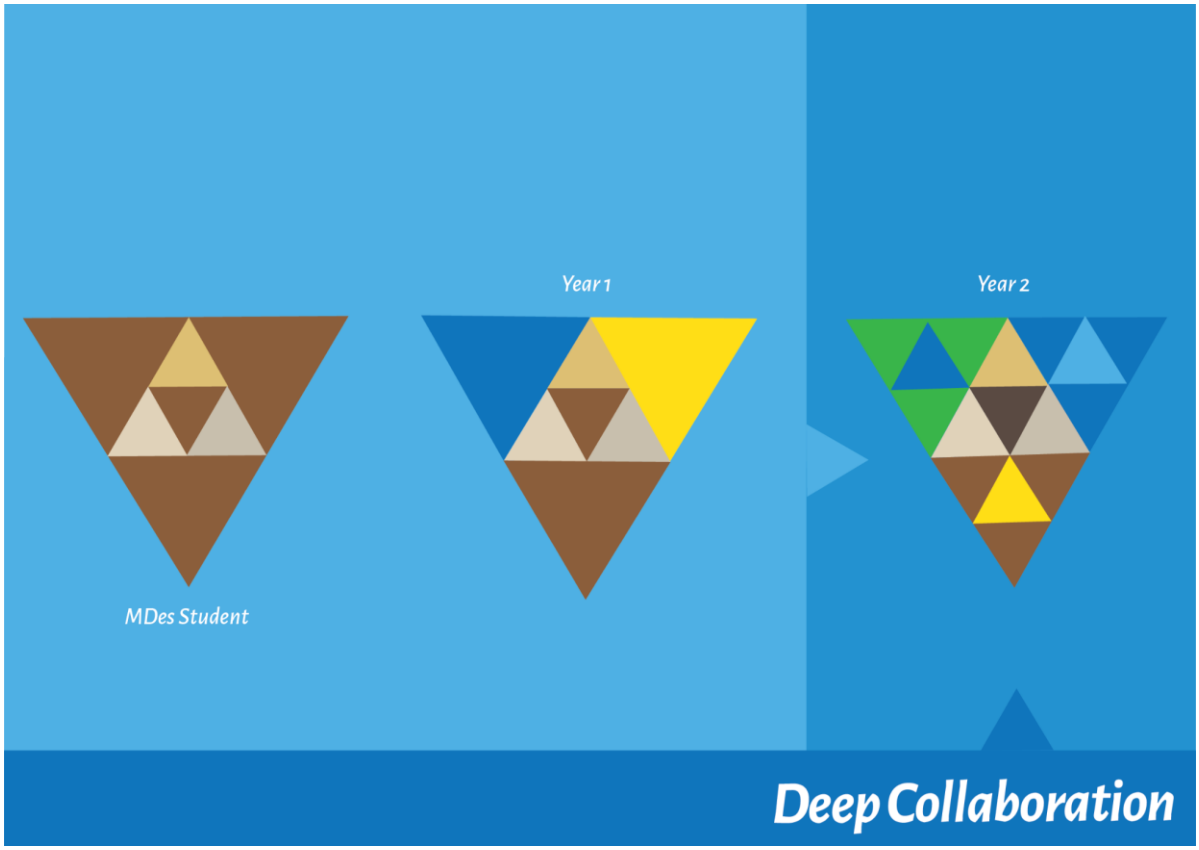


Figure 3. After a rigorous, holistic admissions evaluation, a student cohort forms as a collaborative unit charged with addressing equity, access, and justice in relation to a wicked problem in society (e.g., poverty). Over two years, students in the cohort converge the first year to work together on class projects. In the first year, the student's knowledge evolves informed by required courses within the program and external elective sources in the broader academic community. Graduate students receive advising from two faculty members and the program director who serve as co-primary and secondary advisors, respectively. In the second year, students diverge towards an individual thesis though still consulting with each other in the process of carrying out a peer-, faculty-, and community-engaged inquiry. In the second year, the student's knowledge evolves further informed by required and elective courses and consulting with a thesis committee composed of a faculty member, a cognate faculty member from another discipline, a community partner, and the environment itself (depicted as a green triangle). Source: ©Audrey G. Bennett 2021

Components of Radical Synergy: Anti-Racism and Decolonization

In design education on the graduate level, students must be cognizant that they are entering a design conversation situated within a long history entrenched in primarily Western, patriarchal, racist, colonizing, and heteronormative ideologies. The canon of design is broad and crosses disciplines with a particular emphasis on Western perspectives; whereas non-Western perspectives lie mostly marginalized in the periphery of the discipline. There are two essential processes of decolonization. One is to add new materials from the outside. Some authors were excluded because, when the canon was formed, their people were not free. The other is to rethink the "west-ness" of the canon (e.g., see Bennett, 2012 and Bennett, 2021): what elements have we assumed to have origins from the West but are later shown to have hidden content or origins from the periphery? Students must be cognizant that both strategies are simultaneously available; that one can be rediscovering the old and reinventing the new simultaneously. Each student's path through the discipline's canon is driven by their research interests nurtured and honed through their curricular experiences in the program. In a learning environment that reflects radical synergy, texts that undergird learning emerge top-down from required courses and weekly advising sessions and bottom-up from interactions with community stakeholders—emerging from the student's evolving intellectual identity as a professional integrative designer with a culturally informed perspective. The texts that cross the student's path top-down are essential to providing entry into a part of the broader design conversation most relevant to the MDes program's pedagogical mission. Each text is like a node in a vast system that connects the student to a wealth of other pertinent readings in the field, even some in the periphery.

Components of Radical Synergy: Integrative Design Thinking and Making

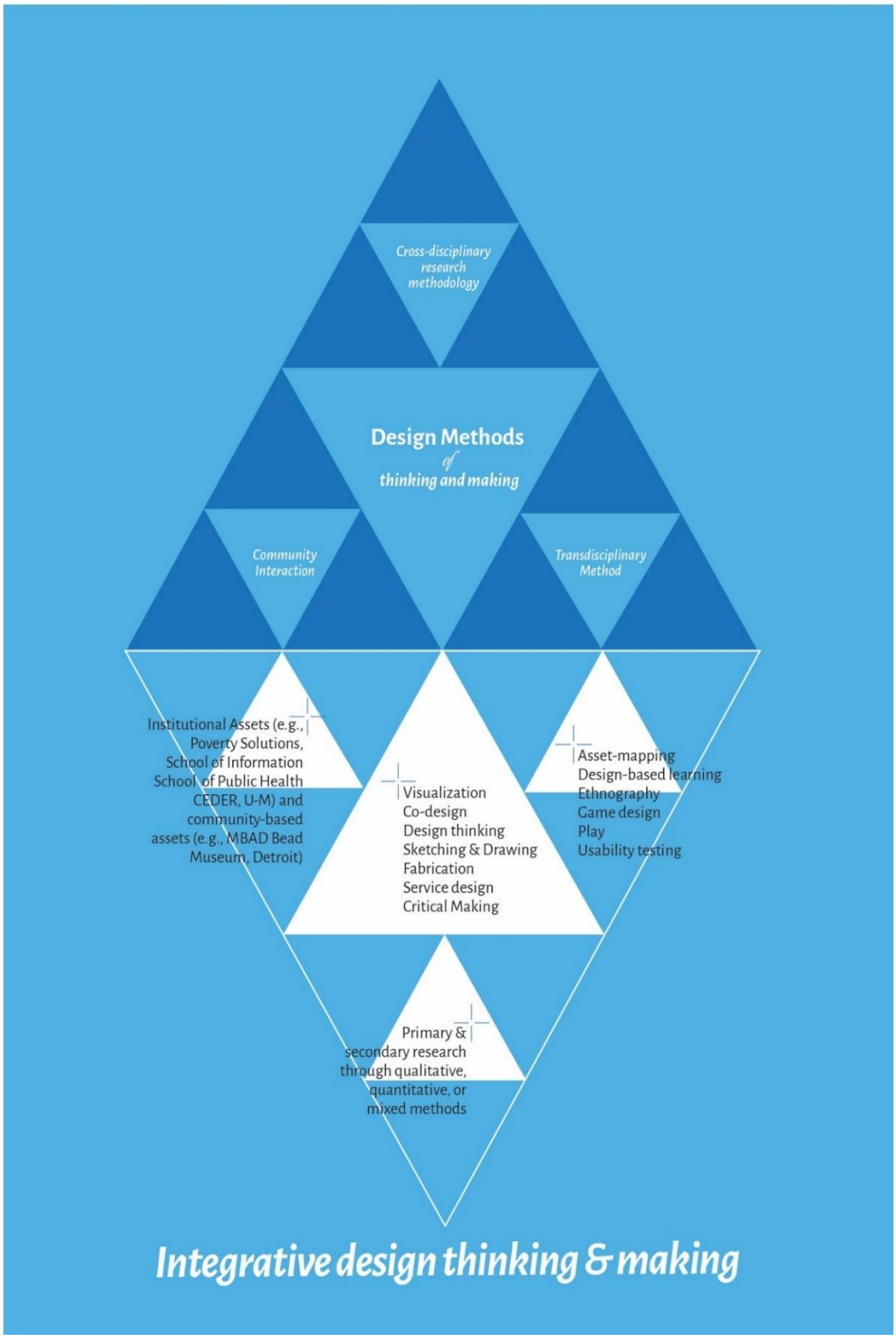


Figure 4. Tuareg triangle is used to visualize each student's integrative design thinking and making in the learning process. Students combine design methods with cross-disciplinary research methodology, transdisciplinary methods, and community interaction to address a wicked problem in society that causes inequity and injustice. The top image's reflection across the horizontal axis shows in the image below a sampling of the design methods, community partners, and transdisciplinary methods used by former students in the program. Source: © Audrey G. Bennett 2021

Components of Radical Synergy: Integrative Critical Analysis

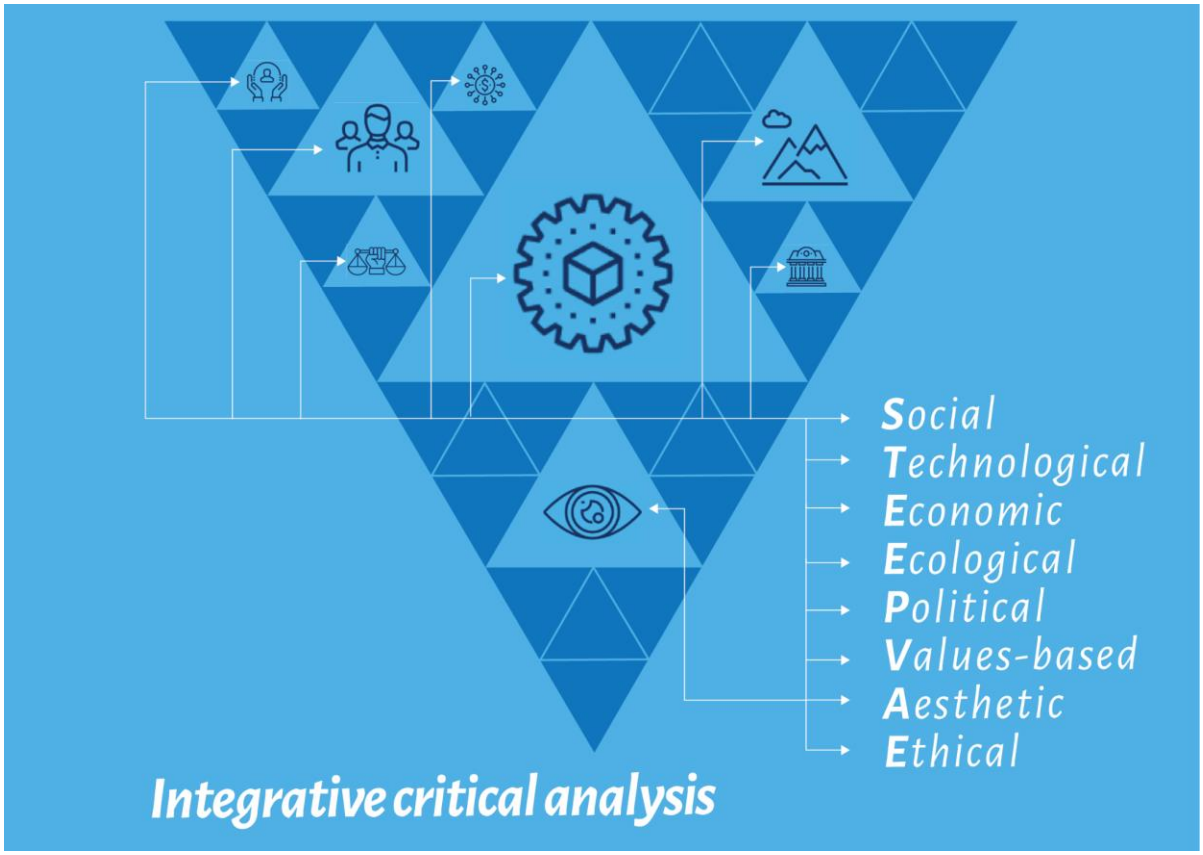


Figure 5. Tuareg triangle is used to visualize the integrative critical analysis undertaken by students in the program. This approach is undergirded by the well-known STEEPV analytical framework extended in this paper to include aesthetic and ethical analyses but pronounced the same. Source: © Audrey G. Bennett & Penny W. Stamps School of Art and Design 2021

In the next section of this visual paper, we provide abstracts accompanied by photographic snapshots of three faculty-led integrative design projects that take steps toward radical synergy through facilitating community-based, designerly activities that exemplify the different components of radical synergy that inform its deep collaboration.

Towards Radical Synergy Through Integrative Critical Analyses

In the initial stages of deep collaboration, the emergent interactions that embody radical synergy have yet to occur. What is taking place is problem definition and understanding. Students use the STEEPVAE analytical framework as an entry point into the early stages of collaboration in the students' theses. This framework, as STEEPV, is often used in the foresight community, sometimes with an added legal aspect known as PESTLE (Loverridge, 2002; Morrison, 2007). Program director Audrey Bennett has added the aspects of A-aesthetics and E-ethics. STEEPVAE is an analytical framework used by the students to understand the impact of the social, technological, economic, ecological, values-based, aesthetic, and ethical aspects on the wicked problem and their research topics. Indeed, no matter how many letters we add to it, there is no guarantee that will happen. STEEPV has most notably been developed to serve major corporations, including Shell. It is not as though after STEEPV, Shell oil became a solar energy company owned by local communities. However, it is critical to start with a clear basis by which students can begin their analysis. The STEEPVAE framework in Figure 5 provides a much-needed structure in this earlier stage of deep collaboration to organize nodes of information and stakeholders and connect the dots by visualizing the importance and role of each stakeholder and, as a result, identifying community partners and other stakeholders with whom to collaborate.

This step activates and enhances the radical synergy in the graduate student's research topic by nurturing a contextually situated inquiry, an iterative process that allows networked collaborations with partners, designers, nonhuman agency, and other parts of the socio-technical ecosystem. This step also allows the formation of analytic themes, awareness of nascent resources, delineation of colonial and dominant culture

impacts, and design ideation to become an emergent property of the network. In the current context of the pandemic, we have used the opportunities afforded by the virtual learning environment to collaborate amongst ourselves as an MDes thesis studio to explore the STEEPVAE framework where students work collaboratively to explore their topics on a mural board. This step is an early stage of collaboration amongst the students where they can contribute to each other's topics as well.

One of the graduate students in that cohort (Larrea Young) worked on establishing a just and equitable system for making food choices in the cafeteria for high school students. The STEEPVAE analysis helped the student identify the ecological and ethical impact of these choices made by high school students as the most crucial elements within her research, which led her to seek community partners such as FoodCorp (https://foodcorps.org/) as potential collaborators for her project. FoodCorp is an organization that emphasizes social equity and the right to healthy food for every child regardless of race, place, or class. For another student in the same cohort (Najwat Rehman), realizing the political sphere of action in his research topic was the most significant parameter. This analysis resulted in the student focusing on policymaking in food futures and collaborated with policymakers in Pakistan's food system.

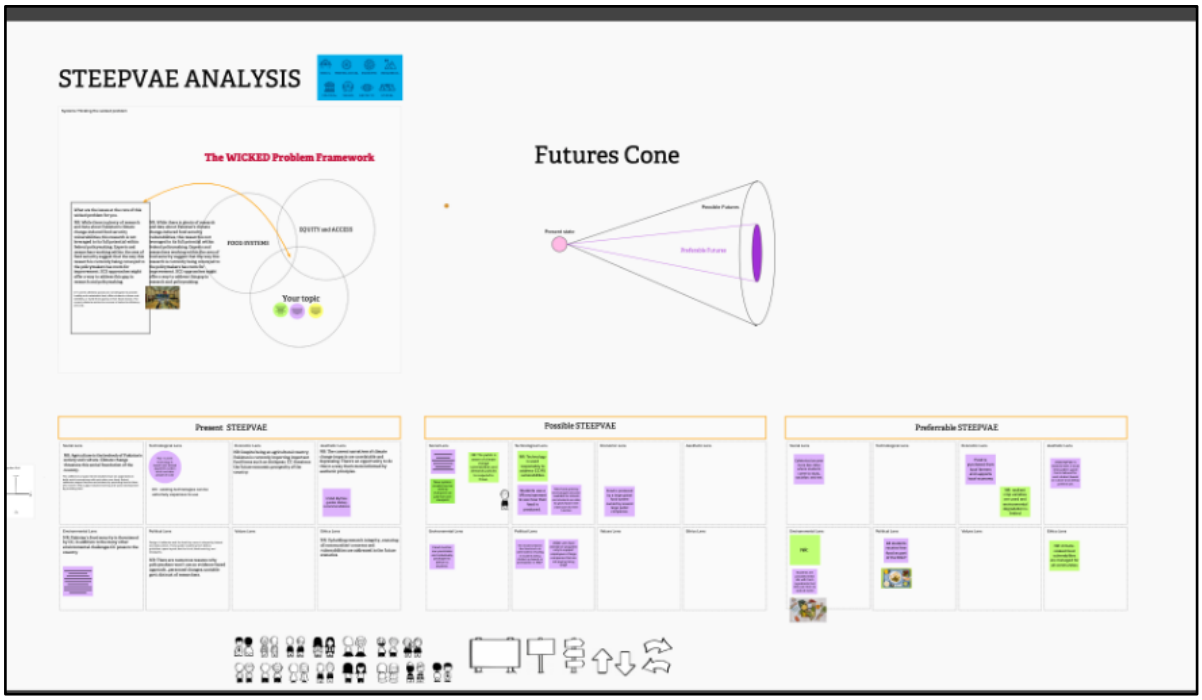


Figure 6. Documentation of a Mural board showing STEEPVAE analysis being conducted with graduate students who are remotely located due to social distancing requirements as a result of the COVID pandemic. Source: © Deepa Butoliya 2021

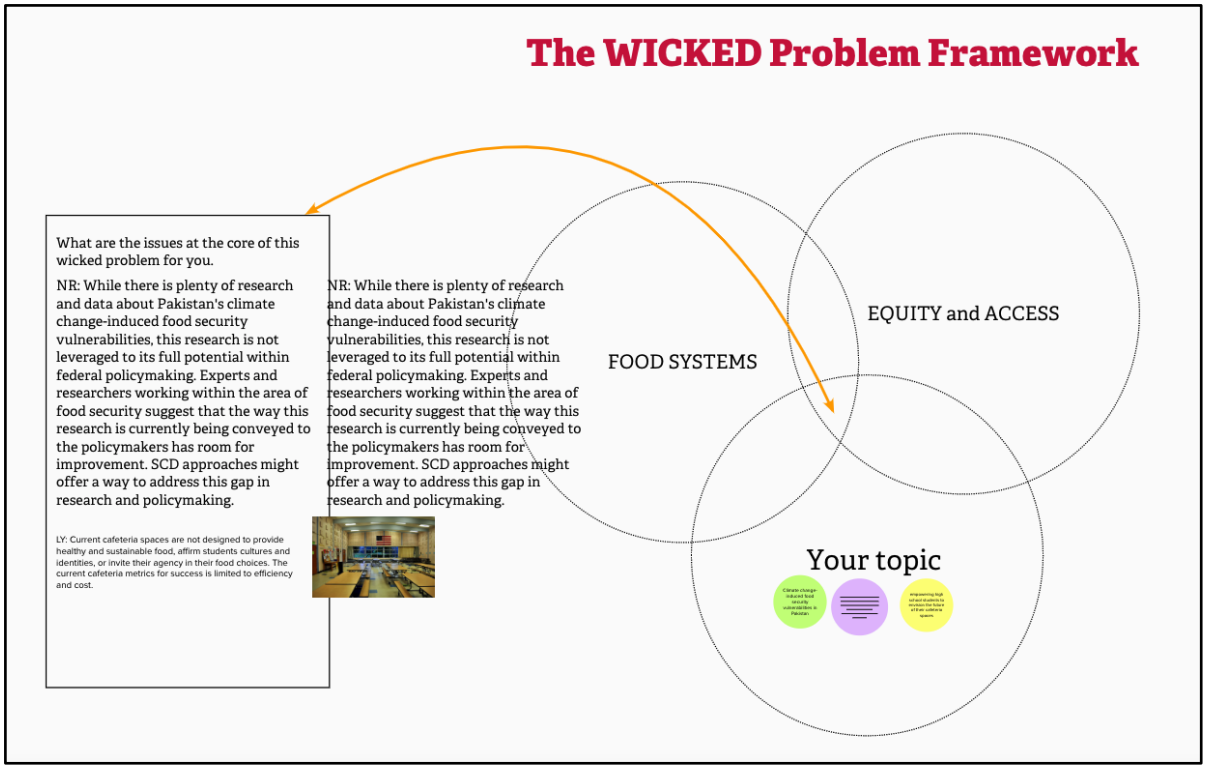


Figure 7. Documentation of a process where students were reflecting on their thesis topics and its correlation to the wicked problems within a generative justice model. Source: © Deepa Butoliya 2021

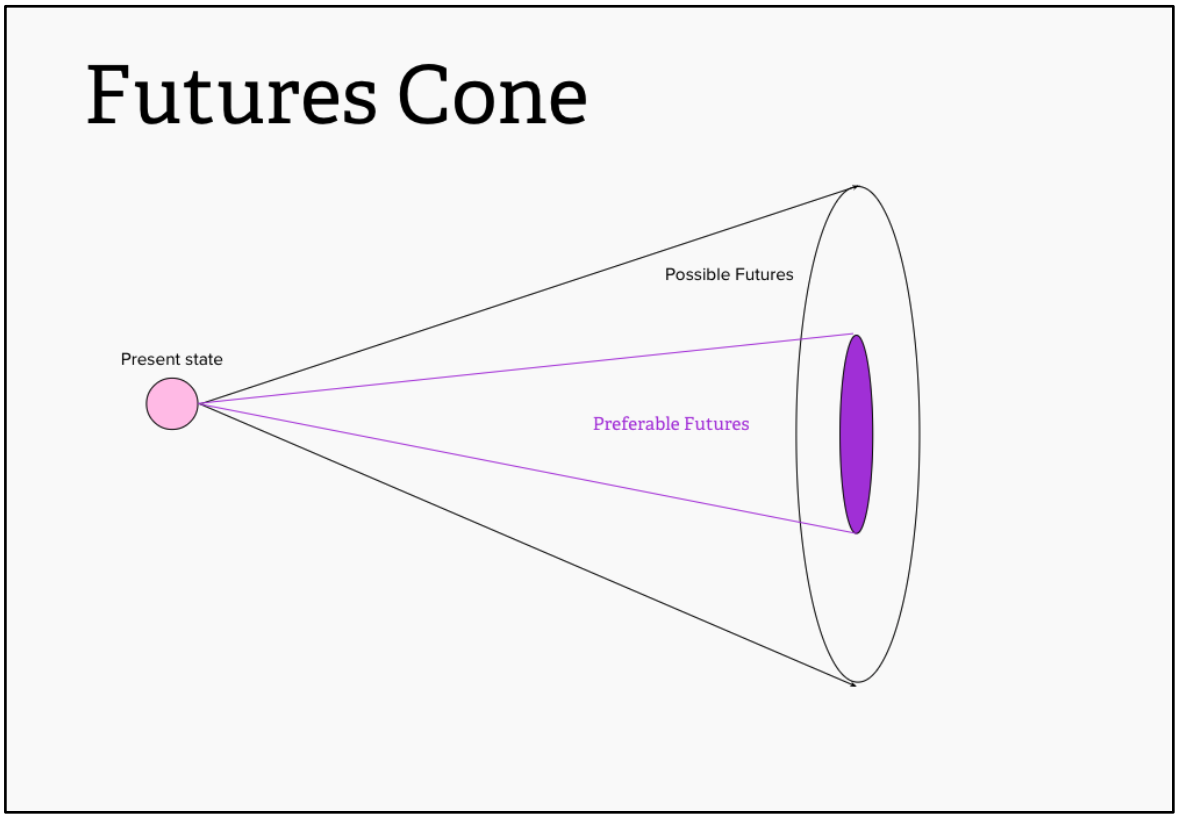


Figure 8. Modified futures cone. Futures cone used in this analysis is a simplified version of futures cone from future studies (Voros, 2017) to enable the students in analyzing the present state, possibilities and the preferred state of the STEEPVAE factors of their topics. The overlap of STEEPVAE and futures cone attempts to create a radical synergy in the context of temporality of the project. Source: © Deepa Butoliya 2021

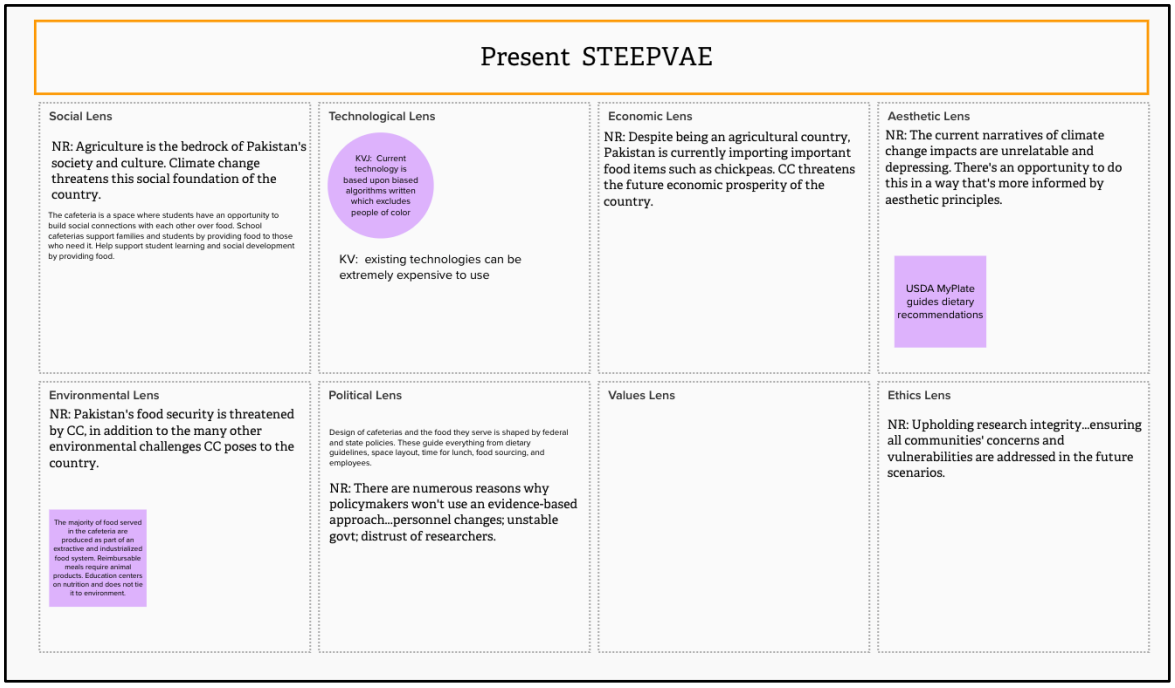


Figure 9. Documentation of a Mural board showing Present STEEPVAE analysis being conducted with graduate students who are remotely located due to social distancing requirements as a result of the COVID pandemic. Source: ©Deepa Butoliya 2021

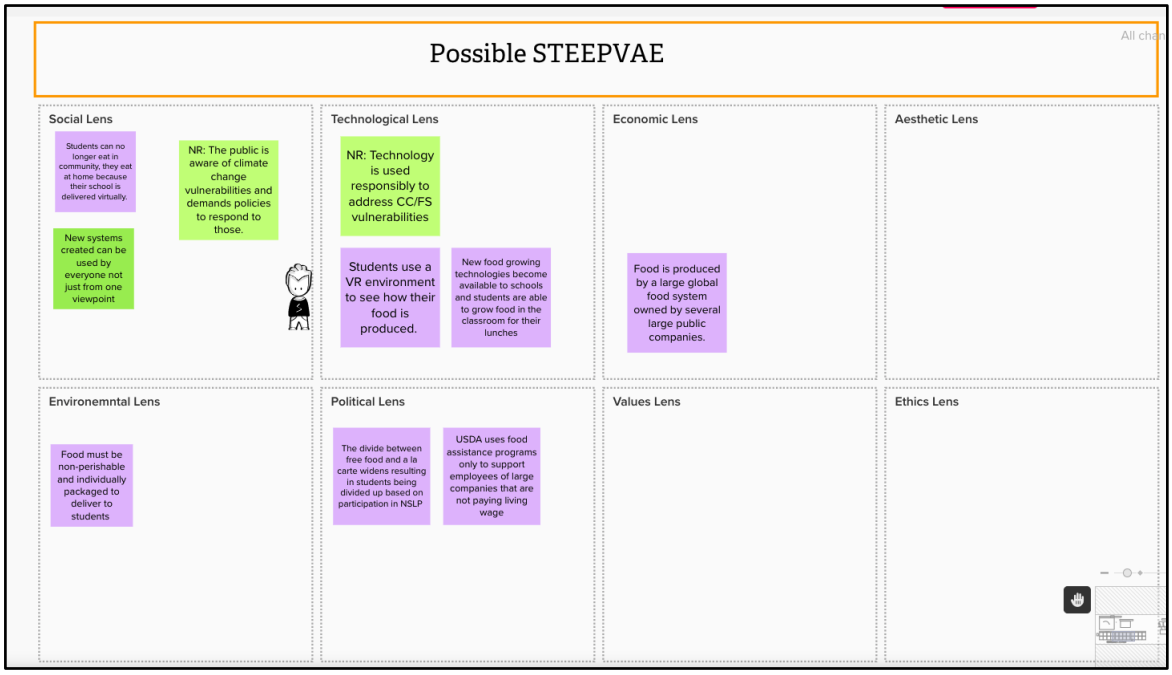


Figure 10. Documentation of a Mural board showing possible STEEPVAE analysis being conducted with graduate students who are remotely located due to social distancing requirements as a result of the COVID pandemic. Source: ©Deepa Butoliya 2021

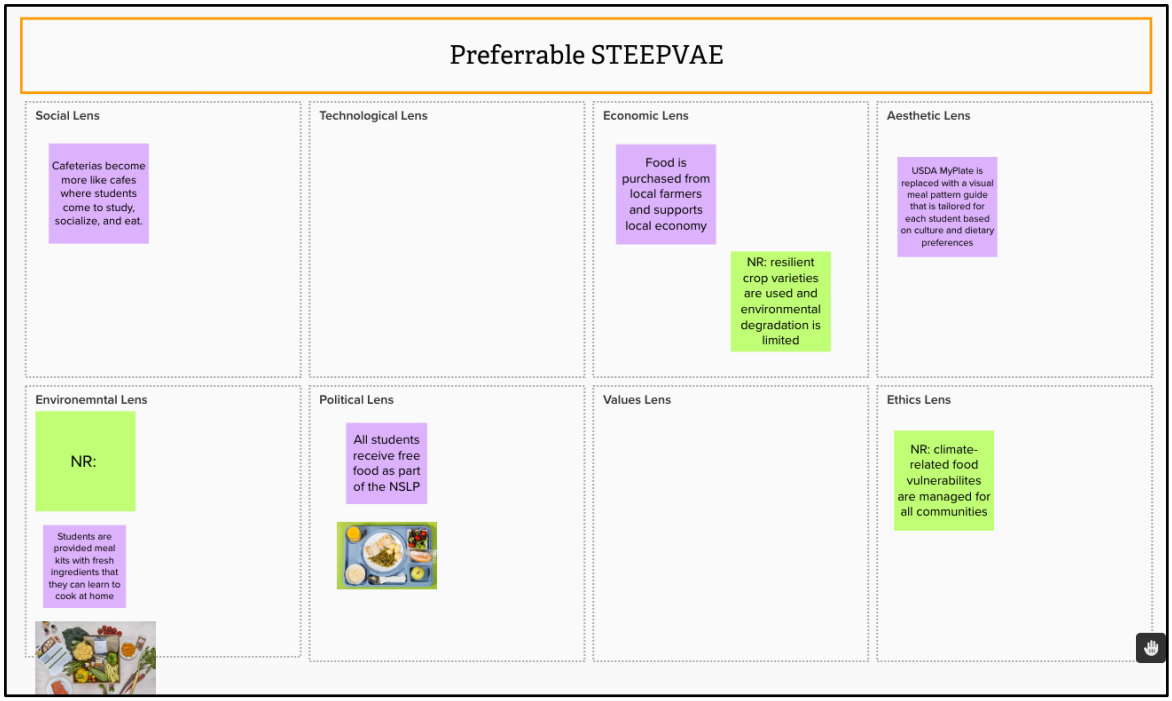


Figure 11. Documentation of a Mural board showing Preferable STEEPVAE analysis being conducted with graduate students who are remotely located due to social distancing requirements as a result of the COVID pandemic. Source: ©Deepa Butoliya 2021

Towards Radical Synergy Informed by Anti-racism and Decolonization

In a recent design charrette with the "African Bead Museum" in Detroit, our students ran into a bit of a challenge. Our simulation software for the AfroFuturist Greenhouse was pretty sophisticated; it was not clear that the director of the museum, Olyami Dabls, would be able to participate by directly manipulating the virtual design. So our students created a "space of possibilities" in which he could select his preference. However, we stumbled on an accidental synergy in doing so: one of the shapes was an almost exact match to his brass "elbow" beads from Ghana.

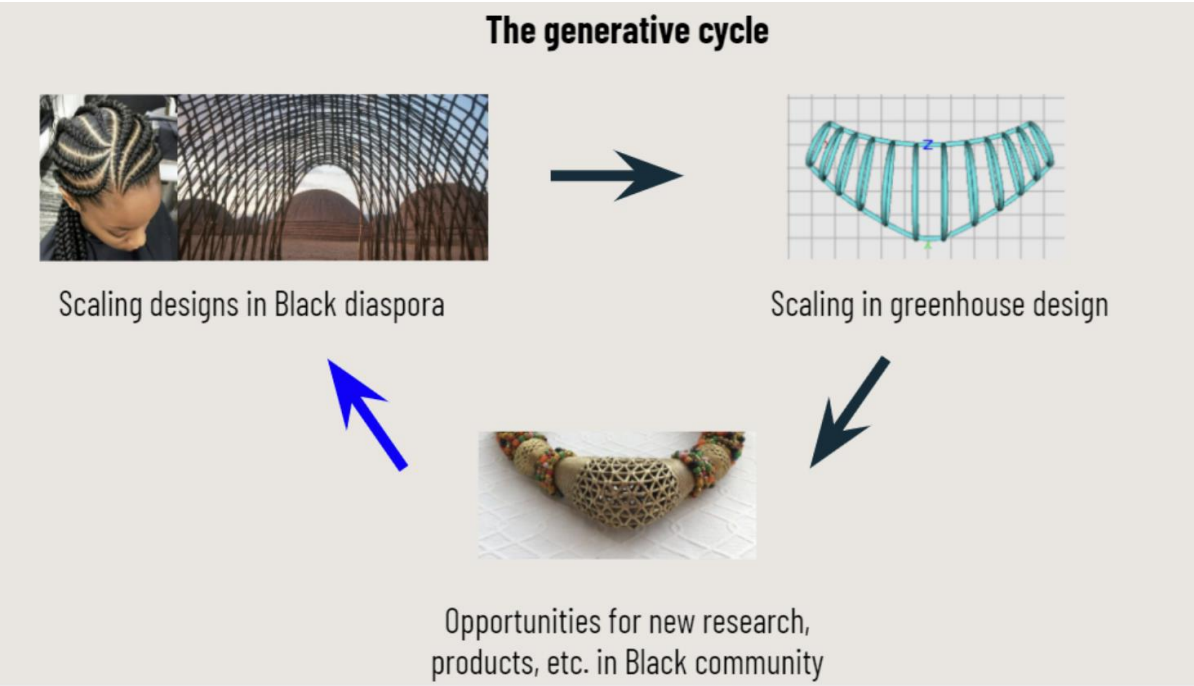


Figure 12. Generative Justice Cycle. Source: © Ron Eglash and Audrey G. Bennett 2020

Dabls' connection opened up an entirely new path of investigation in the relations between the simulations and African designs, which resulted in the students developing a workshop delivered to 110 Black high school students in Detroit. In other words, like an ecosystem in nature, an academic ecosystem needs to work as a circle, not a one-way path. Community participation should not be a shallow end-point, a gesture of noblesse-oblige. It should be a cycle of anti-racist transformation, both from and to the academy. That means an ongoing evolution of mutations, emergent forms, new off-shoots, etc. Such unpredictability is inherent to synergistic emergence, but it is also a hallmark of any democratic process.
There is nothing incredibly unique about our projects; anyone can take the leap of faith to bring in communities of color as colleagues in a synthesis of research and anti-racist activism. In a little over two decades, we have carried out this three-part cycle—community-based research, academic analysis/synthesis, and returns of value to the community—in many parts of the world. That includes Native American communities in the Southwest, Alaska, and upper peninsula Michigan; African communities in east, west, and southern Africa; Spanish-speaking communities in both the US and abroad, and so on. Those interested in this approach can tour these tools and materials on our website, generativejustice.org.

A Graduate Student's Inquiry on Generative Justice

How can one design culturally situated technologies that move us towards economic justice? Economies in plant production? The focus of this Graduate Research Assistant project was to examine Indigenous knowledge and production systems and merge those traditions with contemporary technology. Our current economic systems use value extraction, creating pollution and wealth inequality. Indigenous approaches did not alienate value; instead, it was circulated (Eglash et al., 2020). We examined several Indigenous models. One is from Ghana, where adinkra artisans have been using bark to make ink and cycling the used bark back into nature via composting.

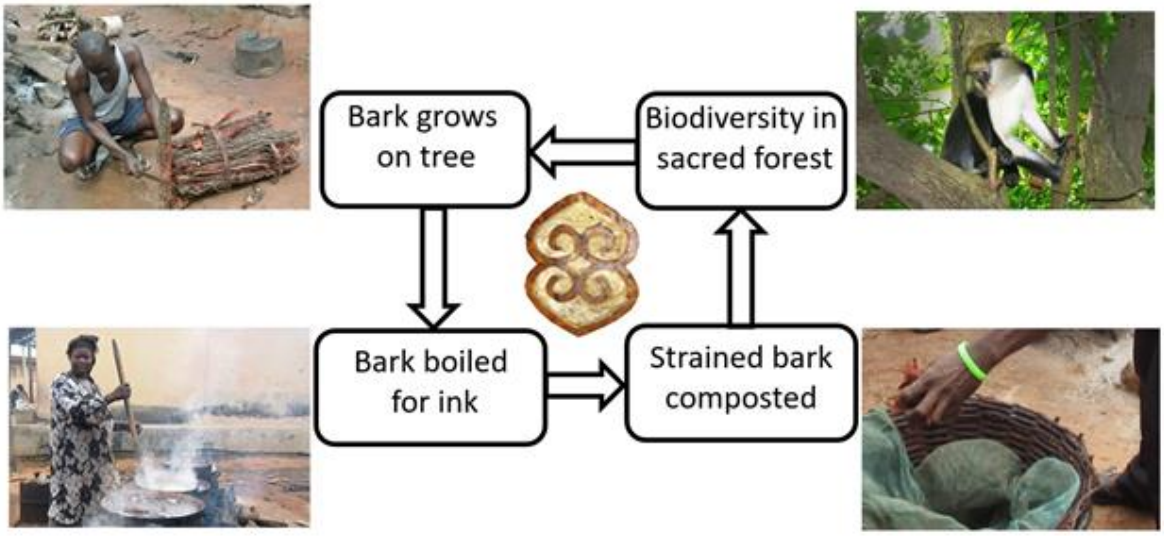


Figure 13. African technologies interlocking cycles in the African context. Source: © Ron Eglash 2020

However, we found that some of these traditions made it through the middle passage to African American traditions. Research has emerged within the Wye plantation where Frederick Douglass was enslaved, where he built, engineered, and operated an impressive greenhouse in 1775 that still stands. This greenhouse structure is celebrated for its architectural beauty, but evidence suggests that through decades of toil within the greenhouse, enslaved African Americans were conducting a series of agriculture trials on medicinal and food plants.

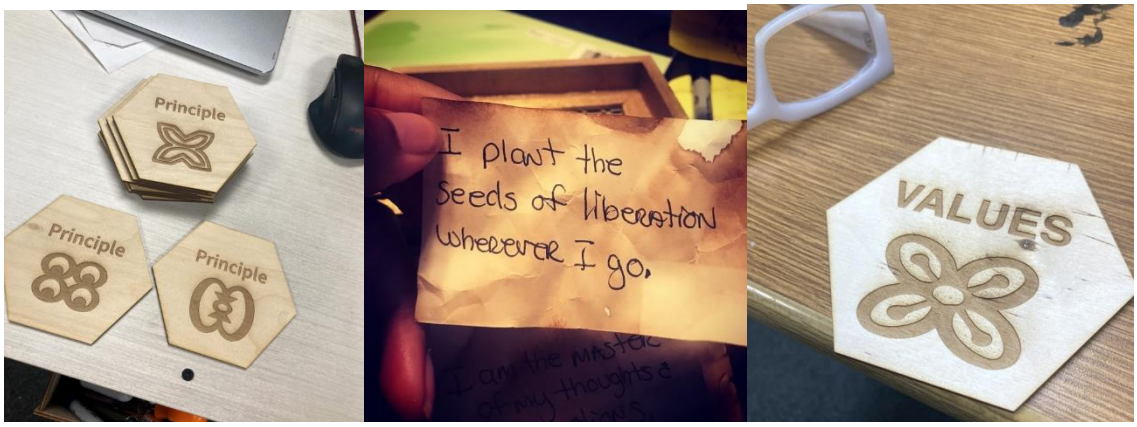


Figure 14. Infusing African Adinkra values and principles within an African Indigenous design process. Source: © Keesa V. Johnson 2021

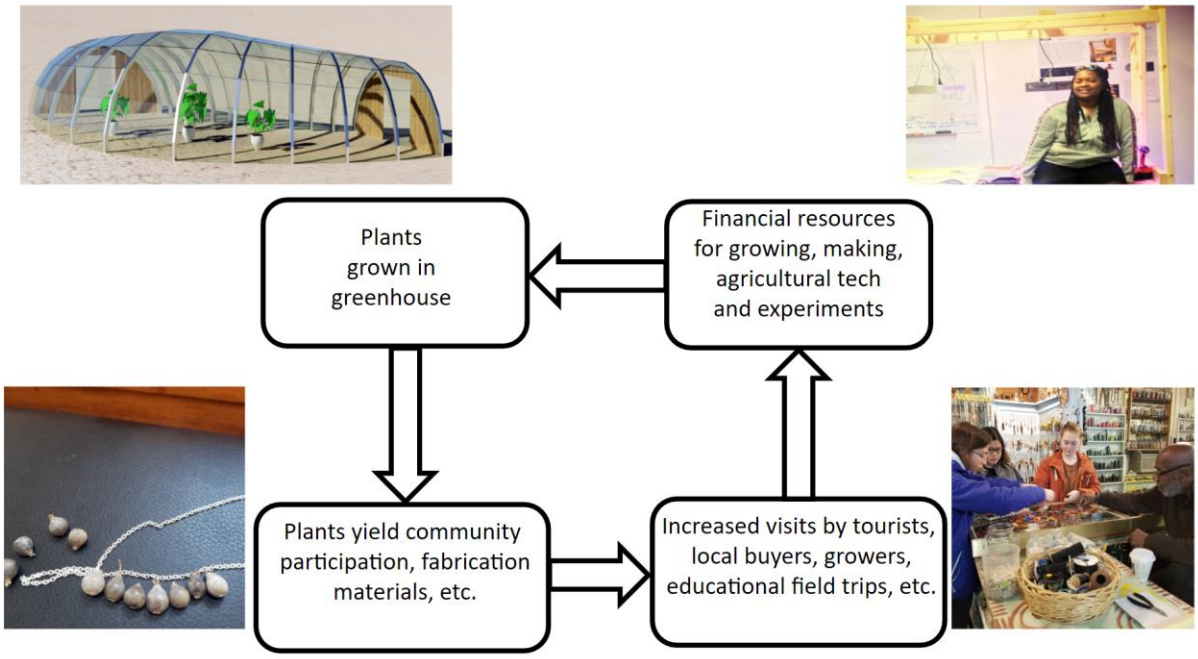


Figure 15. Generative flow for expanding community involvement through the loop of growing, making, selling, and sharing. Source: © Keesa V. Johnson and Ron Eglash 2021

Building on those traditions—both the original and the more recent hybrid forms—led us to develop plans for an "African Futurist Greenhouse" for the Detroit African bead museum. The GSRA's duties included designing grow lab equipment and learning research methods for controlled experiments. We concluded that our best bet would be Job's tears (Coix lacryma-jobi). The Jobs tears seeds, which grow around a central stem, leave a hole in the center naturally, and for this reason, they are cultivated as beads in Africa. By growing the beads on the museum grounds, we can allow visitors to see the African production system at work. The greenhouse space will also be used as a community garden to draw in more local participation.

As we began to conduct these experiments, we realized we would need a professional "grow bench" that could track humidity, temperature, etc. Building the grow bench opened up access for us to pay homage to our African ancestors for the generative technologies of a circular system, more recent innovation in greenhouse technologies, and a glimpse of the future as digital sensors and robotics are designed for the greenhouse. Before we started building the grow bench, we had no idea of the history behind these plants or how they might become a model for African Futurism. So, it is imperative to allow design students to practice making in ways that tap their cultural heritage, historical research, and forward-looking hybrids to create a synergy between knowing, seeing, and doing. It empowers them.

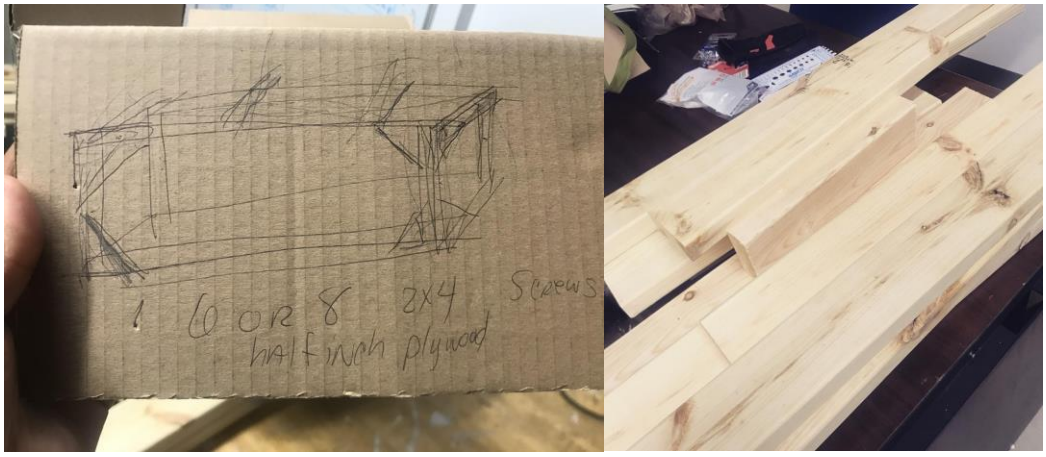


Figure 16. My drawing process and the wood being used for the grow bench. Source: © Keesa V. Johnson 2020

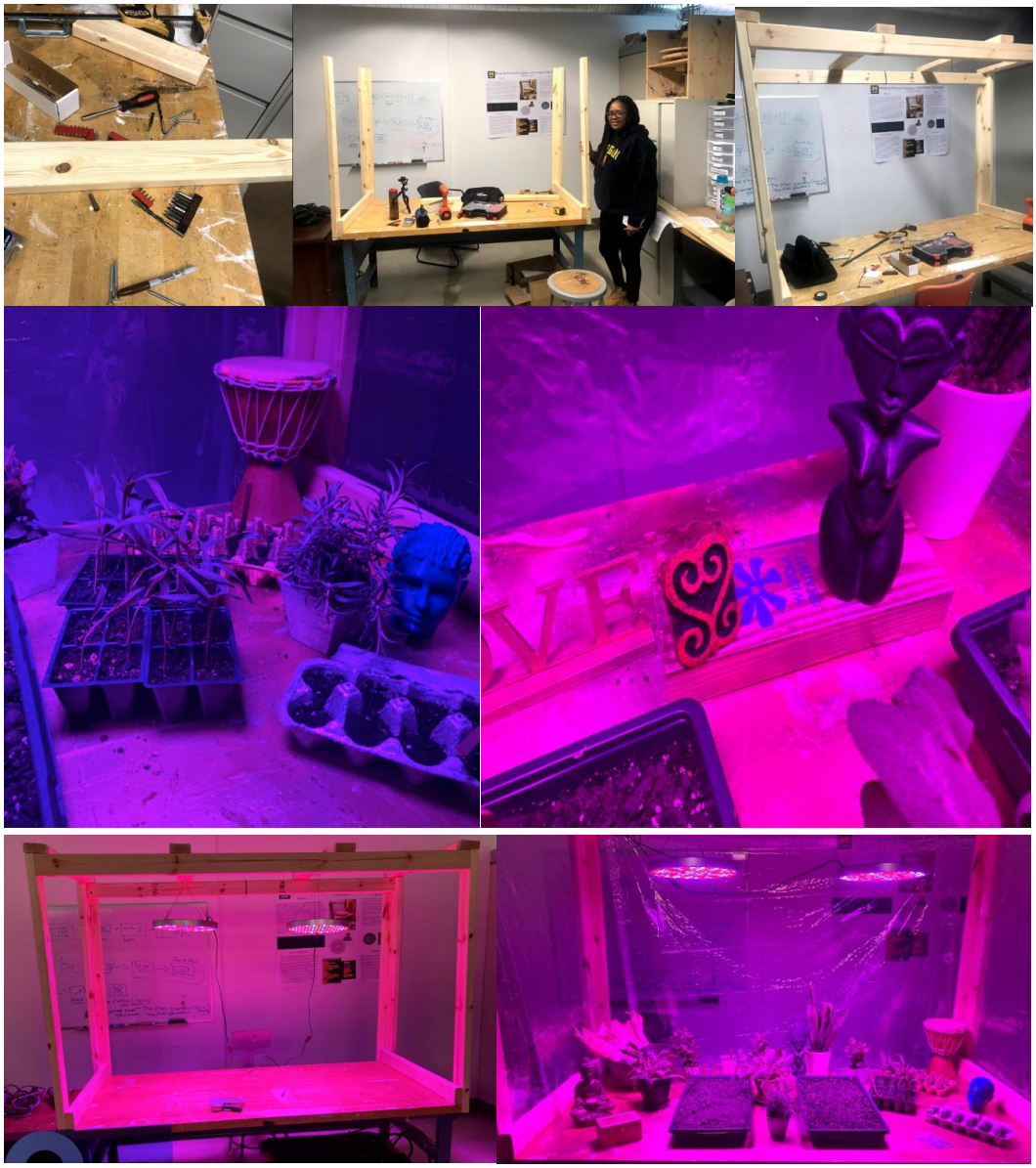


Figure 17. The creation of the grow bench with embedded cultural artefacts inspired by the graduate student's learning journey or something she created. Source: ©Keesa V. Johnson 2021

Towards Radical Synergy Through Integrative Design Thinking and Making

For an international service-learning course, MDes partnered with Ateliescola Acaia, an arts-based kindergarten through 6th-grade school in São Paulo, Brazil, to develop and implement a two-week long workshop with their fifth and 6th-grade students and teachers. The partnership was an opportunity to learn from innovative educational models that address issues of equity and access in education outside the U.S. context. To facilitate co-learning and discovery across cultures in this context, we centered our workshop activities on joint observation and playful exploration of everyday environments in and around the school through different perspectives. To achieve this, we built traditional Brazilian kites and captured top-down views through drone cameras attached to the kites (*Pipa Vista*) and ground-up views by placing the same cameras on our feet (*Pé da Vista*) and then documented these activities through a series of videos we produced with the students and teachers. These workshop activities became a way to get to know one another and share different methods, and tools designers may use to observe and make sense of the world around them. The driving question that we used to collaboratively reflect on the workshop activities in both Portuguese and English was: what can you see?

Figure 18. Acaia students and their art teacher placing markers to indicate where students live in the surrounding neighborhood. Source: ©MDes C4/Assocreation

Figure 19. Acaia and MDes on a field trip to the park to fly kites with drone cameras attached. Source: ©MDes

Figure 20. Acaia students explore their school grounds and surrounding neighborhood with camera "eyes" attached to their shoe or sandal. Source: ©MDes C4/Assocreation

What did we see? We determined that this integrative design thinking and making experience made us keenly aware of our own designerly biases. For example, communicating our understanding of top-down views such as maps required more contextualization than anticipated. We did not fully consider the meaning of such symbolic representations (e.g., bird's eye view of streets or building footprints) in a culture and community in which individuals typically get around by asking for directions or referencing real-life, physical cues, or landmarks. Likewise, our initial concern that the low-angle shots of the feet cameras may be too abstract or uneventful for Acaia's young students turned out to be unjustified; what we assumed was uneventful to us was curiously observed and playfully explored by the students. Although our intention was not to make substantive contributions to Acaia's curriculum (if at all), our design aspirations to radically change perspectives facilitated another critical aspect of service-learning that our partners repeatedly emphasized: cultural exchange. We did not fully recognize this value of cultural exchange as a potential catalyst for changes in perspectives of individuals and the related insights into different realities and symbolic representations until the end of the workshop experience. In that sense, simply showing up as integrative designers and participating is undoubtedly not enough. However, facilitating community-based designerly activities that promote playful changes of perspectives and make enough space for the reflection thereof at both ends promises to be a critical step towards radical synergy.

Conclusion

When realized to its fullest potential, radical synergy and the deep collaboration it involves can effect more just and equitable futures. As depicted in Figure 21, we imagine radical synergy functioning iteratively and recursively to beget equity, access, and justice in many futures to come.

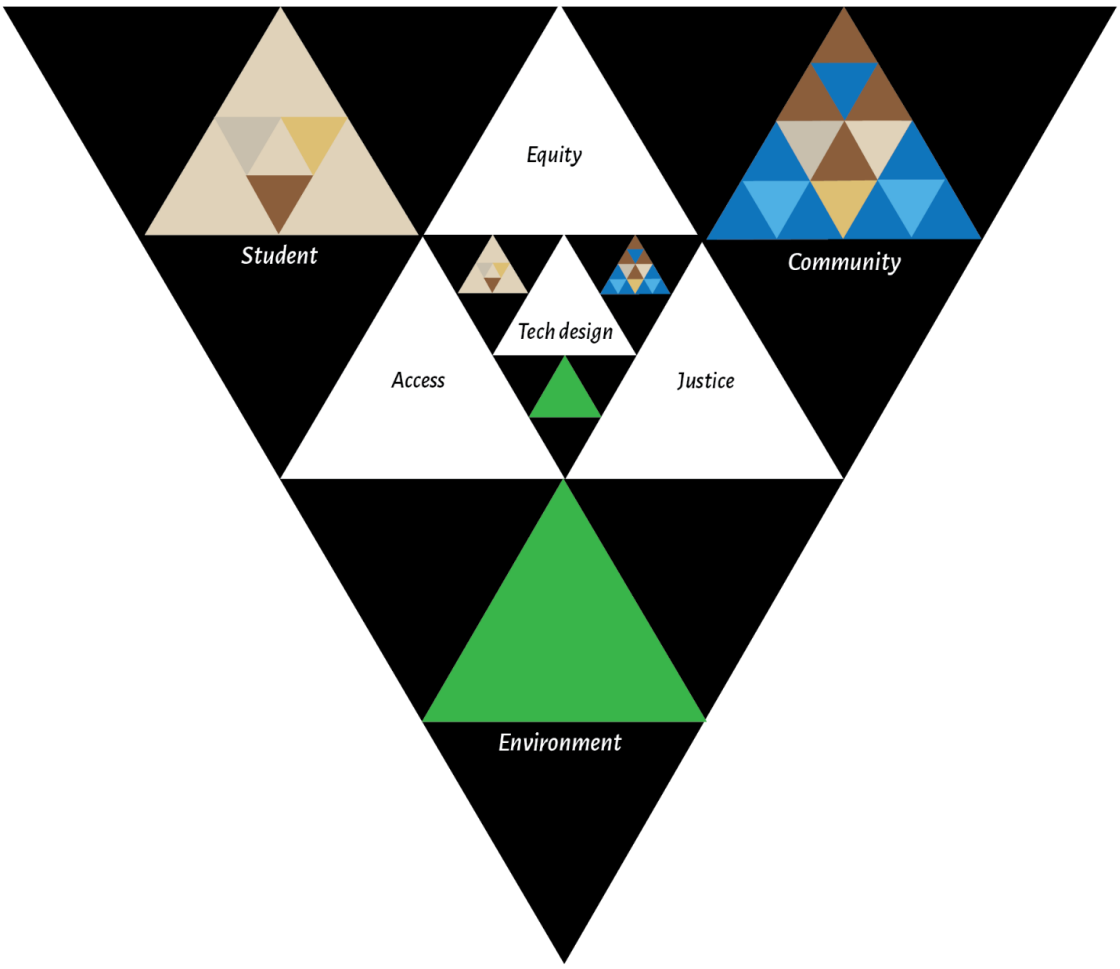


Figure 21 Radical synergy realized to its fullest potential begets equity, access, and justice in an iterative and recursive manner for many futures to come.

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