

# Interventions, Ecologies, Reflections: Reframing Student Resistances with Design Thinking

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**Abstract.** We argue that design thinking is particularly productive in technical and professional communication (TPC) classes when students leverage—rather than succumb to—the risk and uncertainty of the design process. To address possible resistances and to further support TPC students in inhabiting productive uncertainty, we suggest emphasizing and reframing three aspects of design thinking. First, we argue that design thinking orients students to strong interventions rather than the right solution. Shifting terminology to intervention potentially promotes the value of unknowing during the ideation phase and moves students toward a prototype without needing to be correct. Second, we suggest that this reorientation to intervention connects with design thinking’s human-centered design and builds students’ rhetorical awareness as an ecological understanding of situations, texts, and audiences. Third, we point to the role of reflection in design thinking and emphasize it as both iterative and materially entangled, rather than as a final step. To orient students to making interventions and building awareness of rhetorical ecologies, we position reflection as ongoing and embedded throughout the process.

**Keywords:** design thinking, reflection, wicked problems, collaboration, rhetorical ecologies

In a technical and professional communication (TPC) course,<sup>1</sup> design thinking clicked for students when they realized they had no idea how to set up a Christmas tree in their homes. It was closing in on the winter break, and a team of students had decided to write a manual for setting up holiday decorations. Initially, they focused on interior designers, but soon realized this audience would be unlikely to need a user's manual. Through rhetorical awareness, a little reflection, and a lot of laughter, the team realized that, as college students, none of them knew how to decorate for themselves. They let go of an early solution—a manual for interior designers—and reframed their project, still finding value in addressing the social contexts and materials of the winter holidays, but realizing that their project was better suited to an audience of their peers. They focused on composing an instruction manual for college students about selecting, arranging, and decorating a tree for the first time. They researched and considered the range of contexts, traditions, decisions, and audiences, and created a timely intervention, a well-designed instruction manual, to a real problem that they had an investment in.

In our experiences as teachers, students often resist changing direction from an initial plan or idea with an assignment—their first idea becomes the final product. In contrast, how did this team of students willingly shift their audience and the goals of their instruction manual project? TPC programs have endeavored to bridge academic contexts, theories of production, and workplace efficiency, and TPC courses often include assignments and activities that guide students' thinking and making practices toward practical and user-friendly documents and products through a focus on User Experience (UX), experience architecture, or interactive design. As these students worked on their instruction manual, they were guided to engage in "design thinking," as a way of approaching problems "creatively" (Leverenze, 2014) in a process for creating solutions that is human-centered, collaborative, and responsive (Tham & Thominet 2022; Wible, 2020). Design thinking emphasizes ideation as an iterative process, prolonging the discomfort of unknowing and uncertainty as both necessary and productive. Inhabiting this discomfort allows practitioners to engage with a range of possible choices without settling for a "first" or an "easy" solution when stronger options may be available. In college writing classrooms, students often focus on assignment expectations and tend to want clear answers, prioritizing efficiency of task completion over the quality of an outcome. Design thinking has been implemented in writing

<sup>1</sup> Identifying information has been removed from the retrospective descriptions of students in class activities and discussions. Student materials have been referenced anonymously, with permission.

classes to shift students' approaches to projects by favoring the discomfort of creative-critical practices of problem definition and solution development (Wible, 2020). Engagement with design thinking's approach to wicked problems encourages students, particularly those in TPC courses, to dwell in productive uncertainty (Tham & Thominet, 2022; Levenze, 2014; Garskie, 2022). Productive as it may be, an emphasis on uncertainty also introduces a risk of failure, a possibility that may generate student resistance. In comparison to UX and experience architecture, design thinking has been described as "first a mindset and methodology second" (Tham, 2021, p. 70). It is this design thinking "mindset" that we have found to be generative for students.

We argue that design thinking is particularly productive in TPC classes when students shift their mindset and leverage—rather than succumb to—the risk and uncertainty of the design process. To address possible resistances and to further support TPC students with inhabiting productive uncertainty, we suggest emphasizing and reframing three aspects of design thinking. First, we argue that design thinking orients students to strong *interventions* rather than the right *solution*. Aiming for solutions can, on the one hand, unproductively focus students on seeking a correct answer and, on the other, paralyze students from making the leap from ideation to production. Shifting terminology to *intervention* potentially relieves both forms of pressure created by *solution*—promoting the value of unknowing during the ideation phase and moving students toward a prototype without fear of failure (Greenwood, Lauren, Knott, & DeVoss, 2019; Wible, 2020). Second, we suggest that this reorientation to intervention connects with design thinking's human-centered design and builds students' rhetorical awareness as an ecological understanding of situations, texts, and audiences (Edbauer, 2005; Overmyer & Carlson, 2019). Through multiple rounds of prototyping and testing, students experience their writing as rhetorical through circulated uptake of their interventions while iteratively adapting to responses (Pellegrini, 2022). Third, we point to reflection, a component of design thinking (Hasso Plattner Institute of Design), and emphasize it as both iterative and materially entangled, rather than as a final step (Yancey, 2016). Although design thinking scholarship has moved toward acknowledging the activeness of reflection (Schön, 1983; Kumari, 2022; Tham & Thominet, 2022), there is a residual implementation of reflection as "post" and separate from the active process (Kulak, 2022; Lane, 2022; Wierszewski, 2022). To orient students to making interventions and navigating rhetorical ecologies, we position reflection as ongoing and embedded throughout the process. By emphasizing and reframing these components of design

thinking, TPC students find success with overcoming resistances to the uncertainty built into the design thinking process and experience the value of creating projects that meet the needs and challenges of users and situations.

### **Literature Review: Design Thinking, Wicked Problems, and Reframing**

To situate our classroom observations about interventions, ecological-rhetorical awareness, and iterative reflection, we contextualize three key terms—design thinking, wicked problems, and reframing—within the broader scope of TPC scholarship. TPC has a history of embracing, theorizing, and implementing project-management and design practices into curriculum and pedagogy. TPC's uptake and development of UX has led to rich theorization of design practices and principles as user-driven, collaborative, agile, and responsive (Mara, 2021). Andrew Mara presents UX as a set of principles and methods offering designers, writers, and technical professionals a framework for “helping users perform tasks to accomplish goals” (2021, p. 2). Mara presents five core UX capacities—project oversight, written communication, drawing, verbal communication, and research—for students and professionals to collaboratively and successfully approach projects that center users and their experiences. UX is considered an action-oriented and user-centered recursive practice that utilizes these core capacities to make with and for users.

On the other hand, design thinking as a mindset (Tham, 2021, p. 70) provides a low barrier to entry for a variety of students to engage in TPC projects and courses. Although robust frameworks and practices, such as UX and Experience Architecture, are useful for professionals and advanced students, the value of design thinking comes, in part, from the approachability of the reflection and testing with others that design thinking encourages. Additionally, UX often orients practitioners, in this case students, to a recognized problem and development of a solution, with a focus on collaboration with users throughout the design and feedback processes. As such UX tends to be project-focused, with practices and processes guiding a team to work with users and move toward a measurable end goal or product. Design thinking opens space to reveal previously unidentified problems, also in collaboration with a team and users. Thus, design thinking, like UX, is problem-driven, but it offers a means to open more pathways to consider systems surrounding a site of tension and, thus, addressing a problem that wasn't originally indicated. As Tham (2021) explains, design think-

ing exists at the overlap of social innovation and social justice (p. 71), which situates it to address systems that affect users, communicators, projects, and contexts. A key feature of design thinking is that it “asks diverse teams of designers to create a broad set of potential solutions and then to test those solutions with real stakeholders” (Tham & Thominet, 2022, p. 3), which emphasizes design thinking as a lens for addressing complex problems, including problems encountered by writers.

Design thinking can serve as a bridge to help apply writing knowledge from the TPC classroom to professional contexts. This application occurs when students engage with wicked problems, ones that are ambiguous and conflicting, involve many stakeholders, have complex implications, and suggest no singular solution (Leverenze, 2014; Garskie, 2022). In her *Computers and Composition* article on design thinking and writing, Carrie Leverenze (2014) suggests designing wicked assignments for writing classes that “require us to think creatively about the problem as well as the solution” in a way that encourages ownership (p. 7). As Lauren Garskie (2022) notes in her chapter on wicked problems in *Keywords in Design Thinking*, the pedagogical uses of wicked problems are intended to spark innovation through the embrace of failure and experimentation with the unknown and the ambiguous. Building from Scott Wible (2020), TPC classes, in addition to general composition courses, can benefit from the creative-critical practices and the recursive processes of design-thinking for creative problem definition and solution development (p. 401). Jennifer Sano-Franchini (2017) suggests that a critical meshing of wicked problems and interactive design with a feminist rhetorical methodology encouraging complementary linkages between theory, problem, user, and student-designers that is attentive to “how meanings are contingent on access and power” (p. 89). The communication challenges that TPC students address often present as wicked problems, and design thinking provides a model for approaching such challenges.

Further, as Jason Tham and Luke Thominet (2022) describe, design thinking has origins in reframing and has foundational connections to reflection (p. 5). Reflection has been articulated as a mechanism for reframing problems (Schön, 1983; Taczak & Robertson, 2016). When a problem proves to be particularly complex, “reframing” provides a process for gaining a new perspective. Donald Schön (1983) describes this process as a “frame experiment,” a maneuver that allows a practitioner who is “stuck in a problematic situation which he cannot readily convert to a manageable problem [to] construct a new way of setting the problem—a new frame” (p. 63). Put another way, Ann Shivers-

McNair (2021), working with makers and making practices, describes a productive “disequilibrium” that resonates with the process of re-framing: “sometimes humans bring about disequilibrium on purpose (or at least don’t try terribly hard to avoid it) as a way of innovating in order to do the rhetorical work of solving local and global problems” (p. 66). Getting off balance or shifting a framework creates new space for invention. Design thinking makes use of this reframing mechanism to address wicked problems, and TPC students stand to benefit from practicing this process.

Taken together, design thinking’s potential in the classroom lies in its ability to prompt students to notice real and difficult problems and consider those problems from multiple, divergent angles. Encouraging students to consider “connections between *techne* and design thinking” frames their learning as communicators in context (Pflugfelder, 2017, p. 174). The process also encourages students to seek out partnerships with interested users, sometimes real and sometimes imagined, due to the constraints of a semester, to come up with good solutions to those problems. The Stanford d.school’s approach to design thinking is the most widely known model that has been packaged for students, and it moves through phases to empathize, define, ideate, prototype, and test (Hasso Plattner Institute of Design). This model encourages iteration between and through each step, shaping a multiplicity of divergent ideas throughout the process. Design thinking concretizes the recursive processes of invention and reflection, and for TPC students, this model facilitates connections between designing and writing.

### **Reframing Design Thinking**

To reframe design thinking, we—the authors of this project—have reflected on our own teaching alongside our consideration of TPC scholarship. The first time Michael taught with design thinking, he prompted students in a writing and editing class to organize into teams for a sustained collaborative, client-based project. The first task for each team was to choose a name, and one group of students made an anagram out of their initials, calling themselves Team JAM. It was fun and silly, and the name had them laughing and collaborating. For their project, Team JAM imagined that they would be working for an advocacy group for jam enthusiasts. They developed the tagline “All things jam, no jellies.” In addition to fruit preserves, they considered Jam Bands, Jammers, the Jam, and other jam-related activities, like canning. But what struck Michael was how seriously they bought into the project and the potentially real users for the compositions that

they imagined. They kept pressing, iterating, framing, and reframing until they came up with solutions that seemed to fit a complex need. It started out as a bit silly, but the project generated an interesting conversation for what could be a real, if odd, professional context. Team JAM showed the students' buy in with the project—and revealed a circumvention of what we, as instructors, have typically seen as resistances from students to doing more open-ended projects and working in groups. Team JAM moved through these resistances in a process of reframing, facilitated by design thinking. Design thinking, especially the idea of wicked problems and the problem framing and reframing processes, has helped students work past the "What do you want?" types of questions about their assignments.

In what follows, we offer observations from TPC classes in business writing and in editing and publishing to showcase a pedagogical framework of design thinking that moves students toward interventions through the active use of reflection and rhetorical practices in client-based projects and collaborative proposals. Throughout each course, students were encouraged to adopt a design thinking mindset to increase their willingness to engage with uncertainty. Both courses are housed at a teaching-focused institution, are part of a professional writing concentration, and are also counted as upper-level writing classes for many marketing, communication, and business majors. The first class is a junior-level business writing course that focuses on business contexts and genres such as memos, proposals, and reports. The course is generally practice-oriented but also builds from a rhetorical foundation with a focus on genre. In Michael's business writing course design, students work from individual research and memo writing on campus-centered wicked problems to collaboratively proposing interventions for those problems. The second class, a senior-level editing and publishing course, immerses students in a range of editing and production practices that culminate in a client-based project. Jessi engages students in hands-on practices as well as their underlying philosophies for working as editors and publishers. Through recollections of these classes, we collectively explore a shift in terminology to intervention, describe students' grasp of an ecological-rhetorical awareness, and reconsider reflection as a means to push students' past resistances.

### ***Design Thinking and Intervention***

As Jason Tham (2021) outlines in *Design Thinking in Technical Communication*, suspension is a component of radical collaboration in the design thinking process (p. 102), but it may be seen by participants as holding less value than other aspects of collaborative work (p. 112).

The practice of “suspending closure” (Tham, 2021, p. 102) operates as the difference between, what we see as, seeking solutions and exploring interventions. Although Stuart Moulthrop’s theorization of intervention is specifically tied to cybertext, he provides a useful starting place for our use of the term. According to Moulthrop, an intervention is “intended to challenge underlying assumptions or reveal new ways of proceeding” (qtd. in Holmevik, 2012, p. 27). Thus, an intervention opens possibilities that may have been previously obscured, and making these new pathways available also opens the potential for uncertainty. As Andrea Small and Kelly Schmutte (2022) describe, the world is uncertain, but this uncertainty can be understood as ambiguity that fuels creativity (p. 11). They quote Daniel Kelley, co-founder of the Stanford d.school, who explains, “It’s necessary to go to a place where you have this feeling that you don’t know—the problem isn’t defined well, you don’t exactly know what direction you’re going to go” but this uncertainty is essential “to go to a place that’s new to the world” (qtd. in Small & Schmutte, 2022, p. 12). Along with that uncertainty is the possibility of failure, which Tham (2021) considers an important aspect of design thinking (p. 16). Relatedly, “disequilibrium includes intentionally or knowingly disrupting or destabilizing systems...as a teaching and learning strategy for making,” and makers “cultivate a relatively high tolerance for disequilibrium as a practice of rhetorical invention, in the forms of troubleshooting, failing fast” (Shivers-McNair, 2021, p. 67). Crucial to ensuring that failure is productive, especially for students who may be risk-averse, is constructing a sense of “play” in the process of finding problems and exploring interventions, or as Jan Rune Holmevik describes: “the bridge between play and reflection, ludology and literacy, in a new *inter/vention*” (2012, p. 27, emphasis original). Being able to play, to fail, and to engage with “disequilibrium can serve as a site not only for invention but also for intervention” (Shivers-McNair, 2021, p. 111). A shift in terminology from solution to intervention opens a gateway to uncertainty, ambiguity, and failure as beneficial to the creative work—the potential for play—of designing and writing, rather than a drawback to the process.

In the editing and publishing course, students began their client-based projects by moving through mapping, interviewing, discussions, sketching, and feedback in cycles. These initial stages focused students’ attention on identifying and defining a multiplicity of problems or “pain points” that their clients experienced (Hasso Plattner Institute of Design). Although much of the project mirrored a UX approach, beginning in the uncertain space of identifying a problem, which the client may not have fully recognized, it benefited from a design think-



ing mindset. Even after landing on a possible direction for the project, that choice was reconsidered after gathering additional information from the client. After conversing with multiple stakeholders, students found themselves shaping the intervention to address the most pressing needs, but not all needs, of the client. As these teams of students worked, Jessi noticed that “solution” was no longer adequately serving students in their conversations because they were recognizing that there was not a singular solution and that when their team landed on a solution, oftentimes, it was a gateway to another possibility. As this happened in the classroom, Jessi began talking with students about the pain points—or pressure points—that they saw with their clients’ needs and the kinds of changes they would want to see to alleviate that pressure or direct it in a new way. Throughout the semester, it became clear that *solution* was not adequately explaining the goal of the project. As one student described in a written reflection, “This project was very important in terms of my understanding of editing and publishing, what it means to work as a team, and how important it is to work towards a solution that most people assume isn’t there.” This student’s statement about “a solution that most people assume isn’t there” is ripe for a shift from solution-based thinking to intervention-based thinking. In other words, approaching a project in terms of “interventions” opens additional possibilities for the problems or tensions that might be identified as well as the approaches to addressing those problems. As the instructor, Jessi has begun reframing the language used during the design process from solution to intervention. Prior to the reframing of design thinking with interventions in TPC, students tended to still decide that their first chosen solution was best, even when considering a range of potential options, and focused their energies on justifying and arguing for the effectiveness of their solution whether it worked or not. The framing of assignment deliverables as interventions encourages an ongoing engagement with the ideation and problem reframing moments of design thinking in a way that is productive for TPC.

In the business writing course, design thinking’s focus on recursive ideation encourages students to suspend and return to their problems, re-articulating what makes them challenging and how they might reframe them for different users. In shifting from solutions to interventions, a collaborative team in Michael’s business writing class focused on availability of parking during in-demand times. Their initial solution was to build additional parking garages. By focusing on interventions, campus parking became a larger and more interesting problem that involved land use, costs of maintenance and security, utilization, and

availability. Rather than trying to implement a seemingly easy initial solution, which they determined was costly and not, ultimately, useful for students, the proposal became more nuanced and insightful. In the end, they researched and proposed options for a carpool incentive for parking, avoiding building costs and using available resources. The shift of terminology from solution to intervention also shifts students' focus from the products of technical communication to "play" with being technical communicators (Moeller & McAllister, 2002, p. 204). By framing their ideas as an intervention to a wicked problem, students stepped into the role of "technical communicator," and considered their writing as an important rhetorical act within a wider set of social, material, and economic contexts. Shifting design thinking's terminology from solutions to interventions allows for a conceptualization of TPC for students that is not focused on the end deliverable, but rather with ongoing relationships between writer, document, and user (Bay, Johnson-Sheehan, & Cook, 2018, p. 187).

### ***Design Thinking with Ecological-Rhetorical Awareness***

Wicked problems are ecological, a complex knot with many convergent and divergent entanglements that, while identifiable, lead to many different interventions, stakeholders, outcomes, and implications (Caillus, 2008, p. 101). By engaging with wicked problems through design thinking, students develop a stronger awareness of these ecologies. At the end of his book, Tham (2021) asks, "How can rhetorical thinking be integrated with design thinking and making?" (p. 127). We suggest that the ecological awareness inherent to design thinking can be used to push students toward greater rhetorical awareness that accounts for the connections and consequences distributed between people, contexts, institutions, and communication (Edbauer, 2005, p. 12-13). As Shivers-McNair (2021) describes, the "making" of writing depends on the notion that "Rhetoric is relational. *What* and *how* we know and do is inseparable from *where*, *when*, *in what bodies*, and *with whom* we know and do" (p. 23, emphasis original). What Shivers-McNair explains as relational, we consider ecological across the users, stakeholders, materials, contexts, and products that manifest rhetorically, through language and communication (Fleckenstein, 2018, p. 152). In short, the ecological awareness that develops through design thinking and a focus on wicked problems primes students to understand and engage in work with these ecologies, developing a more robust rhetorical awareness along the way. Design thinking can further reinforce an ecological-rhetorical approach through ideation, empathetic interviewing, and testing (Overmyer & Carlson, 2019, p. 432).

The aim of teaching with design thinking is to “provide the opportunity for students to create real impact in problems they care about through the guiding framework of user-centered design supported by design thinking” (Tham, Howard, & Verhulsdonck, 2022). Design thinking encourages an openness to failure. The welcoming of failure allows students to creatively play with several interventions in complex ecological relationships, and failure becomes an adaptable lens and framework for approaching and supporting creativity in these contexts (Greenwood, Lauren, Knott, & DeVoss, 2019, p. 413). Mason Pellegrini (2022) suggests teaching design thinking as a means of challenging assumptions through gathering data and as a “recursive and context-dependent toolbox of strategies” (p. 329). Design thinking helps students position their work as creative, adaptable, and situated—in short, implicated in, influenced by, and responsible to rhetorical ecologies.

In the business writing class, students collaborated to identify and research a wicked problem on campus and propose an intervention to that problem. Students collected and analyzed discursive artifacts to ask questions about the nature and context of their problem to move towards a human-centric intervention (Pflugfelder, 2017, p. 177). As an example, one team approached a lack of gluten-free and reduced-gluten options on campus, especially with meal plans, as a wicked problem. They discovered that this problem was not unique to our campus and that it was interwoven with institutional goals, capital investments, vendor choice, procurement, and staffing. They sought to understand the perspectives of staff, administrators, a campus nutritionist, and vendor representatives. Throughout their research they ran into difficulty with setting meetings, trusting the motives of stakeholders, and struggling with minimal responses.

As the team reframed the problem, they found a disconnect in communication between student support services, dining vendors, administration, and students. By taking an empathetic perspective these TPC students noticed that the entanglements of staffing, construction, and costs all constrained dining options, and that these constraints were not well communicated to faculty and students, further feeding into the problem. Their proposed intervention included cultivating dialogic partnerships between students, the campus nutritionist, and food vendors; publishing up-to-date web and physical materials to promote transparency; advertising changes via social media; and encouraging campus awareness activities. Their intervention did include offering additional food options while cultivating ongoing conversations within dining spaces for new practices and emergent interventions to develop over time.

By engaging with their wicked problem as ecological-rhetorical, their proposed intervention was emergent, ongoing, and contextual. At the core, design thinking helped these students see that their perceptions of the problem were constructed by discourse, that multiple and divergent perspectives existed, and that their intervention would rhetorically shape the ecology and support ongoing change. Their proposal addressed a real lack on campus, and they used their business writing to compose a persuasive intervention.

### ***Design Thinking with Iterative and Material Reflection***

There has been rich uptake of *techne* as creative, epistemic, and reflective in TPC, positioning students and teachers as artisans in human-centric creative situations (Moeller & McAllister, 2002; Pflugfelder, 2017). Focusing on methodologies of design through *techne* invites students to “think expansively about themselves as technical communicators” (Moeller & McAllister, 2002, p. 188) suggesting ways in which playing with creativity and inquiry inform TPC genres and practices. Framing design thinking as *techne* “involves human-centric, divergent, outside-the-box approaches to design and refuses to choose specific methods simply because of external constraints” (Pflugfelder, 2017, p. 174). Building on Donald Schön’s work, Pflugfelder positions design thinking as *techne* which constructs knowledge through critical self-reflection situating creative thinking habits (2017, p. 171). Through *techne*, design thinking is positioned as a reflective practice that is a human-centered, creative, and divergent approach to problems.

Reflection is a deceptively slippery concept and practice. As teachers and writers, we tend to attach the word to discussions and assignments without much fanfare, but its integral role in writing and in the design thinking process—and thus its importance—suggest that it might benefit from a bit more attention. For UX, there is a sense that “documentation is really just a form of reflection and preparation for the next action” (Mara, 2021, p. 19), and with the d.school starter kit, reflection tends to be prompted at the end of an activity. Observing design thinking in our TPC classes, we hesitate to designate reflection as a practice that occurs at the *end* of a process or interaction. In writing studies, reflection has been defined as “a deliberate way of systematically recalling writing experiences to reframe the current writing situation” (Taczak, 2015, p. 78). When students finish an ideation activity, they reflect. When they complete prototyping, they reflect. Thus, reflection is woven into the design thinking process—but we argue that it is woven into and through each materially-driven practice, as well. Put another way, reflection occurs iteratively and materially as design-

ers work through design practices. In a study on metacognitive reflection and transfer with TPC students, Josephine Walwema and Dana Lynn Driscoll (2015) realize that “our metacognitive instruction simply wasn’t substantial enough, or sustained enough, to en-act meaningful change” (p. 42). In short, truncated reflection has truncated results.

As students began their client-based projects in the editing and publishing class, students worked through the Stanford d.school design thinking starter kit (Hasso Plattner Institute of Design). They had already organized into teams, with each group working with a different client—one group focused on an organization that hosts an annual workshop for researchers and the other group worked with a digital archival space. Each student had completed a series of sketches for possible interventions to address the challenges of their team’s client, and they got together in their teams to discuss options. Up to that point, students had been humoring Jessi—going along with the design process, good-naturedly, but not yet fully buying into what the class was doing. As they discussed their sketches in their teams, Jessi witnessed a shift in tone. The class had been “reflecting” at the end of each small task, as prompted by the d.school’s workshop, but in this discussion, reflection began to weave into their sketching process, *and* it was integral to the conversation with their team. It wasn’t a matter of reflecting after the discussion had come to an end. The sketches and discussion, themselves, were an ongoing and iterative process of reflection, catalyzed by the materiality of putting pen to paper and the material embodiment of participants leaning into the conversation, pointing at sketches, trading papers, and gesturing toward possibilities.

The whole scenario reminded Jessi of Donald Schön’s (1983) example of an architecture teacher working with a student (pp. 79-104). The student brings a challenging design layout to the teacher, and the teacher engages in what Schön calls “reflection-in-action” as a process of engaging with thinking and doing—the teacher combines sketching, thinking, and explaining as a method of working through the challenge with the student (p. 102). This is what Jessi witnessed with these teams of students: a process of thinking, sketching and re-sketching, and conversing to slowly build toward a new way to reframe the problem and indicate a possible solution—a possible intervention. However, these students emphasized two aspects of reflection that Jessi hadn’t fully understood when reading Schön’s work or, for that matter, Kathleen Blake Yancey’s (1998) uptake of it for writing studies. These students showcased a materiality of reflection and a sense that this reflection was distributed across their collaboration.

As Louise Wetherbee Phelps (1998) notes, reflection is not individual, but rather an interweaving of people and perspectives (p. 152). These students' sketches evolved as they discussed possibilities. The students pointed to parts of their sketches, revised sections, and underscored key possibilities. As one student noted in a reflection, "The brainstorming activity that was given before we started the project helped me look deeper into the root of the problem and therefore work with my team to find a solution to the discovered issue." Those sketches also served as a material connection in their collaboration, making their reflective process collective—distributed across each other and the materials of the design process—rather than housed in any of them, individually. The process of "intervening in a material-rhetorical situation ourselves—or teaching our students to intervene in material-rhetorical situations—involves all of our body in the making, not just our mind and linguistic communications" (Shivers-McNair, 2021, p. 64). Reflection in design thinking becomes increasingly effective as bodies, materials, and ecologies infuse the process.

As Yancey (2016) explains, reflection is iterative (p. 311). As such, reflection functions particularly well alongside design thinking because "the iterative nature of the design thinking methodology transforms the collaborative workflow" (Tham, 2021, p. 70). Following the lead of students, future versions of the editing and publishing course position reflection as an explicit component of the rapid prototyping exercise in design thinking. Prototyping, which "prioritizes material solutions over conceptual/abstract ideas" and invites "students to build/make their ideas into tangible forms" (Tham, 2021, p. 97), provides an ideal site for iteratively engaging in a material reflection to further the project and the collaborative process. User-centered design and prioritizing user-experience is inherently reflective, in a collaborative sense, because creators must be open to perspectives beyond their own. Tham (2021) suggests that students "prototype radical solutions...with the intention to cultivate radical change" (p. 97). To build on "prototyping toward solutions," the work from students in the editing and publishing class suggests a value in also "reflecting toward interventions." Asking students to reach beyond their own experiences ultimately pushes them to consider unknowns, and the ambiguity of reflection (Yancey, 2016, p. 309) feeds into the creative potential of uncertainty and ambiguity of the design process (Small & Schmutte, 2022, p. 11), leading to new interventions.

## **Conclusion**

Michael brought an early iteration of this project to a writing group

with Jessi and a few other writers. Michael had circulated a proposal, research notes, and a messy outline prior to the meeting with the caveat that the materials were “thinking on the page” and “tracing out ideas,” and he was looking for generative feedback. In the process of talking through these materials, Michael had identified two possible trajectories for considering design thinking in his classroom that he might pursue in his scholarship: the ability for design thinking to facilitate collaboration or design thinking as encouragement of student willingness to fail persistently on the way to better, rather than easier, solutions. Michael said he was leaning toward the first option because it was more straightforward. Easier. To which Jessi noted that this choice would work in direct opposition to the very observation Michael had made in his second possible trajectory. As such, a kernel of this project started during that conversation, from the willingness to step back, to possibly fail, and to follow the path of the less obvious, but potentially more fruitful, trajectory. As instructors, it makes sense to apply the advice we give our students as we pursue our own work. Thus, we’ve tried to follow the encouragement we give to students: to shift away from easy solutions toward productive interventions, ones that they (and we) like and care about, and not just settling on the first idea only to suffer to make it work.

Thus, this project makes the attempt at a stronger intervention for how design thinking can function in TPC classes and can offer different affordances than other approaches for students, such as UX and experience architecture. Our experiences resonate with Shivers-McNair (2021) when she says, “As a teacher of rhetoric and writing, my goal is to prepare students to intervene in rhetorical situations and wicked problems and to write in complex academic and professional situations” (p. 114). Through design thinking, we guide students as they consider a challenge or problem and determine a range of possible interventions to address the issue. They select an intervention—for now—based on an ecological-rhetorical awareness through the practice of a distributed and iterative collaborative reflection. This process is meant to build their capacities, tools, mindsets, and practices in the TPC classroom and for the professional contexts that they will enter.

We find that design thinking’s potential in the classroom hinges on its ability to work with students to notice real and difficult problems and consider those problems from multiple divergent angles. The process also encourages students to seek out partnerships with interested users, sometimes real but oftentimes imagined, to address wicked problems from unanticipated pathways. Design thinking helps students contend with the writing process, and the messiness of creat-

ing, by offering a set of practices that situates their writing within a complex web of interactions, considerations, and communities. As a student in the editing and publishing class explained in a final reflection:

This project helped me realize that finding the root of the problem and thinking of new, attainable solutions can help with your own creativity and other people's projects. It is also an important place to figure out what you stand for or what kind of change you want to see in the world. This project helped me realize that accessibility is important to me. Without people having the ability to reach a platform or information that could be crucial for their futures, there would be no change in the world.

This student hints at the value of intervention in their deep exploration of a problem and their articulation of "new" possibilities. Focusing students on intervention over solution, rhetoric as ecological, and reflection as entangled, softens their resistance to uncertainty and situates them to address wicked problems, engaging in design thinking as a mindset to break through the artificial boundaries of course expectations to open pathways for doing real work in and beyond the classroom.



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