Design Thinking for Engaged Learning Overview

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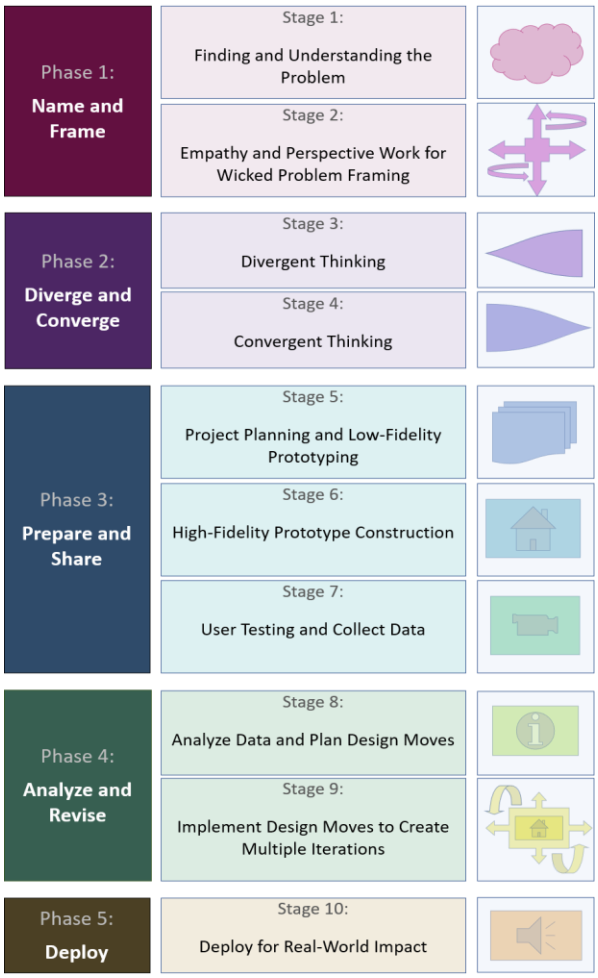
The Design Thinking for Engaged Learning (DTEL) model was developed to serve as the scaffolding structure for powerful and transformative collaborative project-based learning. The DTEL model process includes five phases broken down into 10 stages, as well as 10 designerly ways of knowing. It is grounded in learning theories and principles from the Learning Sciences. In the DTEL model, learners use and develop designerly ways of knowing while going through the design thinking process. Some of the designerly ways of knowing are more prominent during different stages, but should all be used in all stages of the process.

The Design Thinking Process

The design thinking process in this framework has ten stages in five phases.



Phase 1: Name and Frame

This phase is when a problem is identified, framed, and re-framed from multiple perspectives.

Stage 1: Finding and Understanding the Problem

In this stage you will identify the problem and do some background research to understand the problem.

Stage 2: Empathy and Perspective Work for Wicked Problem Framing

In this stage you will engage in empathy and perspective taking activities, after which you will re-frame the problem as a wicked problem.

Phase 2: Diverge and Converge

In this phase you will do what designers call "ideation" — coming up with as many possible solutions as you can, and then organizing them into categories and refining them until you are able to decide which potential solution to move ahead with in prototyping.

Stage 3: Divergent Thinking

In this stage, you will individually come up with as many solution ideas as possible (at least 20 ideas for each individual in your team) and share them on your team's virtual whiteboard.

Stage 4: Convergent Thinking

In this stage your group will work together to re-arrange the ideas on the virtual whiteboard until all the ideas are in clusters. Then you will discuss the clusters and decide as a team which cluster you will pursue. Finally, your team will synthesize ideas in the cluster to formulate a solution idea statement.

Phase 3: Prepare and Share

In this phase you will build low-fidelity prototypes, then a high-fidelity prototype which you will then "test" by deploying it outside this course in order to collect data about it.

Stage 5: Project Planning and Low-Fidelity Prototyping

In this stage you will start by doing a bit of project planning with your team. Then individually each member will create a low-fidelity prototype (for instance, a sketch, flowchart, process model, list, etc.) and share it with your team.

Stage 6: High-Fidelity Prototype Construction

In this stage of the design thinking process your team will all work together to collaboratively construct ONE high-fidelity prototype based on the best ideas from the individual prototypes you constructed individually in the previous stage.

Then collaboratively your team will start building your high-fidelity prototype. The high-fidelity prototype must be in the form that the final design solution will be. For instance, if your design is a website, you would actually start constructing the website. Or if your design is a policy brief to be submitted to legislators, the high-fidelity prototype would be a draft of that document. Or if your design is a marketing campaign, the prototype would include the marketing campaign project documents (for instance, implementation plan) and drafts of media (images, fliers, videos, etc.).

Stage 7: User Testing and Collect Data

In this stage of the design thinking process you will conduct user testing of your high-fidelity prototype and collect data from that user testing. Ideally, you would implement a trial run of your design solution with real-world users who would be people the solution is designed to help. If this is not feasible, you would show your high-fidelity prototype to real-world users and have them give you feedback.

Phase 4: Analyze and Revise

In this phase you will analyze the data you collected the previous stage when you deployed your prototype. You will translate your findings into a set of design moves, which you will then use to make several iterations of your prototype.

Stage 8: Analyze Data and Plan Design Moves

In this design thinking stage your team will collaboratively analyze the data you collected during user testing, and then translate the findings into a list of design moves — changes that need to be made to the design.

Stage 9: Implement Design Moves to Create Multiple Iterations

In this stage you will work collaboratively with your team to implement the design moves you listed in the previous stage. Usually it's best to start with the easiest design moves and then move on to the more difficult ones. As you go through this process, you will create multiple iterations of your design solution, getting more and more complete with each iteration. You may find it useful to do a little bit of user testing between iterations, since each change you make to your design may introduce new issues that need to be resolved.

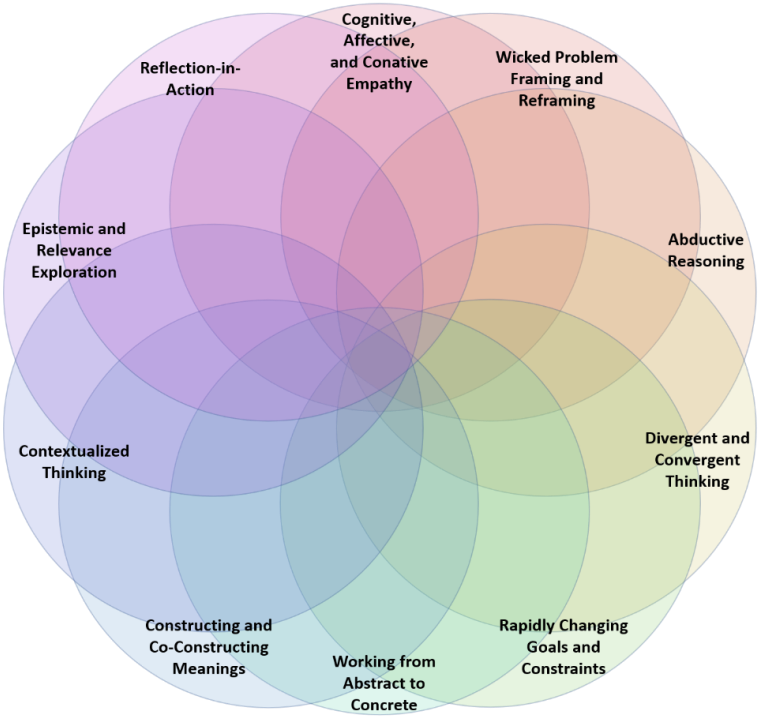
Phase 5: Deploy

In this final phase, you will deploy your final prototype. In this project, that means your group will share your final prototype with the class.

Stage 10: Deploy for Real-World Impact

In the final stage of the design thinking process you will deploy your prototype for real-world impact. Ideally, you would fully implement the solution you design. However, due to time limitations, you may simply deploy it for a public audience (potential real-world impact), for instance by publishing the design on a website.

Designerly Ways of Knowing



In the Design Thinking for Engaged Learning framework, there is a design thinking process described above, as well as a set of "designerly ways of knowing." The desingerly way of knowing known as ***Wicked Problems Framing and Reframing*** happens throughout the design thinking process, but especially in the Name and Frame phase. Expert designers frame design problems as wicked problems which are characterized by a number of features including multiple good solutions are possible, impossibility of a perfect solution, any solution attempted is imperfect, each solution creates new wicked problems (Rittel & Webber, 1973). The framing of the problem is never finalized, and continues to evolve throughout the design process. The problem cannot be defined appropriately until a solution is being developed, but the solution idea cannot be articulated until the problem is formulated. Working in this tension between the continually co-evolving problem and solution requires ***Abductive Reasoning***. ***Divergent and Convergent Thinking*** is also an important designerly way of knowing permeating all stages of the design thinking process and is necessary for working within the tension between the evolving problem and solution, as is ***Rapidly Changing Goals and Constraints***. In academic settings, we become habituated in a modality of thinking from concrete to abstract, rather than the ***Working from Abstract to Concrete*** designerly way of knowing. This issue is compounded by traditions in academia in which knowledge is often depicted as abstract entities, and learning as acquisition of knowledge. In the Learning Sciences, learning is often described as individual, collaborative, and collective construction of knowledge (Donaldson & Allen-Handy, 2019). Therefore, engaging in Working from Abstract to Concrete goes hand-in-hand with ***Constructing and Co-Constructing Meanings***. Developing skills in ***Contextualized Thinking***, along with ***Epistemic and Relevance Exploration***, may broaden our epistemological assumptions to go beyond norms in academia we may have become enculturated into such as prevalent beliefs that quantitative studies produce more valid findings due to an assumption that generalizability should be the goal of research. These problematic norms and assumptions in academia contribute to epistemic homogeneity and reproduction of epistemic injustice, but developing the designerly ways of knowing of Epistemic and Relevance Exploration, Contextualized Thinking, Constructing and Co-Constructing Meanings, and Working from Abstract to Concrete may facilitate habits of mind which can serve to counteract the suffering caused by such norms and assumptions. However, these are generally cognitive processes. A more holistic and balanced approach is introduced through the development of the ***Cognitive, Affective, and Conative Empathy*** designerly way of knowing which focuses the designer on analytically and emotionally understanding the ways in which people—especially historically marginalized or oppressed people—experience the problem for which they are designing, and the ways in which solutions they design may be experienced. This is especially powerful when combined with the Reflection-in-Action designerly way of knowing.