Video 12-2 Iterations and Failure

Design is an **iterative process**. This means that a designer goes through a cyclic process of ideating, prototyping, testing and refining, a solution. Since there are no right or wrong answers, or "the ideal" solution in design, designers repeatedly prototype their ideas, test them out, and evaluate them for changes and improvements to refine the solution. The "new" solution is then prototyped again, so that it can be tested and evaluated, and the process goes on and on, until the solution is optimized to solve the problem.

Henry Petroski described this pretty well alluding to a writer's process in the engineering segment's reading: **"Other recognized masters often express the thought that they abandon a work rather than complete it. What they mean is that they come to realize that for all their drafts and revisions, a manuscript will never be perfect, and they must simply decide when they have caught all its major flaws and when it is as close to perfect as they can make it without working beyond reasonable limits."**

In the tutorial activity, you did go through a measure of iteration before arriving at your final solution. First of all, you came up with 3-5 ideas in section 6 based on your problem statement, and you shared these with your partner to capture feedback, then you went on to reflect on the feedback to generate a new solution. With this new solution you built a prototype of it using paper for your partner to test, and captured his feedback again in section 10. Although the activity concluded at this point, a designer would normally use the feedback captured in section 10 to generate more solutions, prototype these solutions and test them out again. This iterative process helps the designer refine the solution progressively, while keeping open to the opportunity for a breakthrough idea that could emerge at any stage. In fact, when a solution is being tested and evaluated after several round of improvements and does not seem like a good solution, the designer can always reflect and return to the former phases of the process – perhaps he did not have a good enough understanding of design task in the first place, or have not formulated a well-defined problem statement. In design, we do not ask: "What is the correct answer?" but "How do we arrive at one good solution?"

OK, back to section 9 of the tutorial activity, where you harnessed the paper folding skills acquired in the computational thinking tutorial to build a paper prototype of your solution for your partner to interact with. Can you compare the quality of feedback you received from your partner after he interacted with your paper prototype, with the feedback you received in section 7 after you shared your initial ideas with him through your sketches "on paper"? Which one gave you more insightful feedback? Which one could help you assess parts of your solution that worked, and parts that didn't work?

I would imagine that your paper prototype yielded more insightful feedback. Although the paper model was made in a very short time and with paper as a substitute for materials commonly used for wallets, you enable your partner to interact physically with the solution, by doing so both you and your partner could evaluate the solution in many ways that could not have been possible if the solution remained "on paper". Therefore, in design, prototyping is a key phase in the design process. In fact,

depending on the nature and complexity of the solution, we make different types of prototypes to help us evaluate different aspects of the solution. For example, the paper model you made is called a “quick and dirty” prototype that designers make with speed to test out many initial ideas. A functional prototype captures and tests the key functional features and underlying principles of a solution. A cosmetic prototype represents a highly detailed visual model of the solution. An experience prototype simulates a service experience with specific touch points that users can actively participate.

One could say that the iterative process of design is a methodology with built-in failure. Every version of an idea in the design process is assumed to be a necessary flop. From sketches in a drawing pad, to quick and dirty models, to the various forms of prototypes, each representation of the solution is put to the test, or in Holbo terms **“Put to the Question”** and expected to fail, so that designers can learn from these premeditated mistakes and improve on the solution.

Embracing failure as an opportunity for a fresh perspective rather than a woeful end is an empowering mindset. This attribute is certainly not unique to designers or a design process, but present in the minds of great inventors, scientists, and engineers. I conclude this video with 3 quotes.

“Failure is success in progress” Einstein.

“I have not failed, I've just found 10,000 ways that won't work.” Thomas Edison.

“*There is a group of people who do not readily dismiss, let alone accept, even the most trivial of failures. Indeed, they see failures where most of us see only successes. These are the inventors, the engineers, the designers of the world, who are forever trying to improve it through the things in it. To these intrepid pioneers of purpose, a failure of any kind is not so much a disappointment as an opportunity.” Henry Petroski, *Success Through Failure: The Paradox of Design