

When experiences or emotions do not follow expectations. (Bakken Museum)

Failure... embedded in our Design Challenge Learning (The Tech Interactive)

- **Design challenges use real-world problems so that learners are invested in the outcome.**
- **It's iterative, which means learners are trained that failure is okay, and working to overcome it is where growth happens.**
- **It's also collaborative, which is key to future success.**

Failure is a necessary and expected part of the process. Includes technical skills AND emotional resiliency. (Montshire Museum of Science)

Failure... (a) Elevates our approach to process not product and focus on being learner centered; and (b) Supports social-emotional

**learning in the maker space environment.
(Thinkery)**

The act of noticing a moment of unreachd potential that serves as a catalyst or deterrent for learning. (Scott Family Amazeum)

Andréassian et al. (2010) defined failure as monsters; “something incongruous, unexpected, deviating from the norm or unpredictable” (p. 851).¹

Lottero-Perdue and Parry (2017) defined failures as a “normal and expected outcome as a part of the iterative nature of designing solutions to problems, although the end goal is that the solution (hereafter, the ‘design’) is not intended to fail” (p. 1).²

¹ Andréassian, V., Perrin, C., Parent, E., & Bárdossy, A. (2010). The court of miracles of hydrology: can failure stories contribute to hydrological science?. *Hydrological Sciences Journal*, 55(6), 849-856.

² Lottero-Perdue, P. S., & Parry, E. A. (2017). Elementary teachers' reflections on design failures and use of fail words after teaching engineering for two years. *Journal of Pre-College Engineering Education Research (J-PEER)*, 7(1), 1-24.

“whatever [felt] like a failure to the person experiencing it” (Bishop, 2017, p. 962).³

“I’m a big fan of what I think of as beautiful failures—say something was ambitious and well-intentioned, and you're like, “That sucked! Way to go. You got that out of you!” But it had all kinds of great things behind it. I love that. To me, a true failure is a failure of spirit. It's a failure of integrity. It's a failure of authenticity” (Green et al., 2016, p. 480).⁴

“Mistake is when you go back and fix it, and learn from it. Failure is where you make a mistake and give up on it. You don't try to fix it and you don't learn from it.” (Juan, student)

³ Bishop, K. (2017). Framing failure in the legal classroom: Techniques for encouraging growth and resilience. *Arkansas Law Review*, 70(4), 959-1006.

⁴ Green, M. J., Myers, K., Watson, K., Czerwiec, M. K., Shapiro, D., & Draus, S. (2016). Creativity in medical education: the value of having medical students make stuff. *Journal of Medical Humanities*, 37(4), 475-483.

“Failure is difficult, maybe impossible, to define” (Carr, 2013, p. 2).⁵

⁵ Carr, A. (2013). In support of failure. *Composition Forum*, 27. Retrieved from <http://compositionforum.com>