

Design Thinking: Empathetic Solutions for Human Problems

Amanda Philbrick

Instructional Science and Technology, California State University, Monterey Bay

IST 524: Instructional Technology

Dr. Sarah Evanick

Design Thinking: Empathetic Solutions for Human Problems

With modern roots in the early 1900s, the field of instructional technology and design is relatively young (Reiser, 2018). Despite its youth, the field offers a vast array of models and philosophies built on foundational learning theories. One such philosophy is design thinking (DT). Developed in the early 1940s and 1950s by John E. Arnold within the Stanford Joint Program in Design, this approach gained popularity in the mid-2000s in conjunction with the growth of innovation management (Auernhammer & Roth, 2021). Flexible and human-centered, it aims to support practitioners in creatively building concrete, empathetic solutions. Understanding its characteristics, potential areas of application, benefits, and limitations can prepare instructional designers to empathetically tackle complicated human problems.

Design Thinking Characteristics

Five steps comprise a design thinking approach: empathize, define, ideate, prototype, and test (Caroline et al., 2020). Those who engage in DT reframe a problem from a mindset that empathizes with end users, embrace all proposed solutions during ideation, build low-fidelity prototypes, and test models to identify solutions (Lal, 2021). The process is iterative and nonlinear; steps are conscientiously revisited as frequently as necessary (Auernhammer & Roth, 2021).

DT's core activities aim to conquer biases (Auernhammer & Roth, 2021). Ideation, or brainstorming, encourages the generation of many wild proposals. Bad suggestions are embraced in the belief that good ideas will rise from uninhibited creativity. Prototyping swiftly follows with the goal to "get three-dimensional as quickly as possible" (Auernhammer & Roth, 2021, p. 634-635). Creating functional prototypes provides the path to the testing that generates critical feedback (Lal, 2021).

Liberatory Design: Integrating Deep Empathy and Complexity with Design Thinking

A novel approach that combines design thinking with deep empathy and complex design theory is liberatory design. Its first prototypes were presented in 2017 with the stated goal of flexibly tackling complex challenges with equity (Robalewski, 2021; National Equity Project, n.d.). Six nonlinear, iterative stages comprise its design: empathize, define, inquire, imagine, prototype, and try. The overarching framework requires its practitioners to see the problem, engage with stakeholders to create meaning, and take actions from which they intend to learn (National Equity Project, n.d.).

Design Thinking and Liberatory Design in Practice

The flexibility DT and liberatory design offer are compatible with many complex systems. Practitioners tasked with a variety of daunting problems are provided a framework with which to tackle obstacles.

A prime area for application is the “wicked” – unpredictable, ambiguous – problem of sustainability engineering. Ignite, a social innovation program at Duke University, embraced liberatory design tenets as participants worked to generate global night light access solutions in energy-poor areas (Mueller et al., 2020). Looking beyond the simple technical outcomes needed for sustainable development engineering success, liberatory design encourages empathetic understanding of client requirements. In another example presented by Moganakrishnann et al. (2018), engineers are called upon to collaborate with aboriginal communities to determine if clean water concerns ought to be addressed with water access optimization or water treatment plans.

Model-based systems engineering facilitates the movement towards holistic solutions (Tekaat et al., 2021). As classical mechanics transitions to mechatronic and cyber-physical

systems, modeling provides a path to the prototyping critical to DT (Tekaat et al., 2021). Linking design thinking and liberatory pedagogy with sustainability engineering allows reflexive, creative problem-solving to commence (Moganakrishnann et al., 2018).

Beyond engineering, the areas in which DT may be applied are vast. Broadly, its practices have been implemented in K – 12 education, business, government, food innovation, and equity design (IDEO, n.d.). In attending to the decisions people make to uncover needs, the success of companies like Airbnb, Pinterest, and Intuit are attributed to the application of DT tenets (Lal, 2021). Design school students in Indonesia harnessed DT practices to facilitate creation of woven patterns that represent local artisanship and to conceptualize a plan for upcycling unused jeans materials to upholster chairs (Caroline et al., 2021; Fajarwati et al., 2020). DT virtual reality training can prepare business leaders to tackle sustainability challenges, allowing for iterative application of radical solutions without risk (Earle et al., 2021). Successful DT healthcare interventions – educational pamphlets to optimize bone health in breast cancer survivors, gamified transfer technique training, and mobile clinical decision support tools to optimize cardiovascular health – demonstrate that DT can result in both physical and technology-intensive interventions (Altman et al., 2018). Recognizing the value of this modern approach, educational institutions like Berkely Haas Innovation Lab, the MIT D-Lab, Northwestern’s Segal Design Institute, and the Stanford d.school contribute to DT research and curriculum (IDEO, n.d.). In the relatively short timeframe in which it has gained popularity, DT has proven valuable, malleable, and widely applicable.

Criticisms of Design Thinking

Design thinking critics assert that it is in want of clear structure and lacks a strong theoretical base. (Auernhammer & Roth, 2021). Stanford University engineering affiliates

Auernhammer and Roth (2021) argue, however, that DT's humanistic approach to identifying problems and physically designing potential solutions offers an innovative schema firmly built on psychology and design theories. The value of DT is intrinsically linked to those components at which critiques are lobbed – its adaptable structure encourages flexibility in the face of constant change.

It has been asserted that DT dilutes the technical competencies of the experts who seek to integrate community input (Moganakrishnann, 2017). The attempt to empathetically adopt another culture's perspective can result in “half-baked knowledge...[causing] chaos during the beginning of a project” (Lal, 2021, p. 207-208). But a sustainable society is built on understanding the self within the collective whole. An expert's insight is only valuable within the context of the community they strive to serve. If viewed as opportunities, initial crises can unearth points that require confrontation, allowing problem-solving to commence (Lal, 2021). DT tenets guide its adherents to embrace the messy process.

Conclusion

The design thinking approach is versatile, empowering, and grounded in its aim to serve human needs. Embracing diverse capabilities and skill-levels, bold contributions from all are encouraged (Auernhammer & Roth, 2021; Lal, 2021). David Kelley, co-founder of IDEO, a design firm founded on DT principles, asserts that all of us are capable of creativity – DT supports that recognition within ourselves (IDEO U, 2018). Compatible with a rapidly evolving world, DT facilitates swift problem-solving in welcoming wild ideas. Designers expedite the identification and management of flaws, as they “fail fast to see success” (Lal, 2021, p. 16). Ultimately, human-centered empathy sets design thinking apart. In seeing “participants as people first” (Lal, 2021, p. 21), DT practitioners remain steadfastly human-centered.

While critics assail DT's pliant structure, purportedly shaky theoretical grounding, and the inherent complications that generating community understanding entails, it is in humanity's best interest to embrace a problem-solving design methodology that refuses to shy from complexity. As the global community continues to integrate and innovation drives forward, the implementation of design thinking is likely to expand beyond its already far-reaching influence. Instructional designers would be well-advised to take full advantage of this empathetic, collaborative, adaptable design philosophy.

References

- Auernhammer, J., & Roth, B. (2021). The origin and evolution of Stanford University's design thinking: From product design thinking in innovation management. *Journal of Product Innovation Management*, 38(6), 623-644.
<https://onlinelibrary.wiley.com/doi/pdf/10.1111/jpim.12594>
- Caroline, O. S., Fajarwati, A. A. S., Octarina, & Adriani, S. (2021). Implementation of Jepara wood carving patterns for wastra craftsmanship in Troso – A design thinking to create a sustainable creative industry. *IOP Conference Series. Earth and Environmental Science*, 729(1), 1-10. <https://doi.org/10.1088/1755-1315/729/1/012089>
- Earle, A.G., & Leyva-de la Hiz, D.I. (2021). The wicked problem of teaching about wicked problems: Design thinking and emerging technologies in sustainability education. *Management Learning*, 52(5), 581-603. DOI: 10.1177/1350507620974857
- Fajarwati, Caroline, O. S., Rafli, M., & Auliawan, N. (2021). Reused jeans for upholstery of Jepara chairs: A design thinking towards a sustainable creative industry. *IOP Conference Series. Earth and Environmental Science*, 729(1), 1-9. <https://doi.org/10.1088/1755-1315/729/1/012101>
- IDEO Design Thinking. (n.d.) *History*. IDEO. <https://designthinking.ideo.com/history>
- IDEO U. (2018, Dec 5). *IDEO U: What is design thinking?*
<https://www.youtube.com/watch?v=ldYzbV0NDp8>
- Lal, D. M. (2021). *Design Thinking: Beyond the Sticky Notes*. SAGE Publications India Pvt, Ltd.
- National Equity Project. (n.d.) *Introduction to liberatory design*. National Equity Project.
 Retrieved on November 16, 2022.
<https://www.nationalequityproject.org/frameworks/liberatory-design>

- Moganakrishnann, J.A.S., Namasivayam, S.N., & Ismail, N. (2018). Linking liberatory pedagogy to engineering and sustainable development. *MATEC Web of Conferences*, 152, (04003), 1-11. <https://doi.org/10.1051/matecconf/201815204003>
- Mueller, J.L., Dotson, M.E., Dietzel, J., Peters, J., Asturias, G., Cheatham, A., Krieger, M., Taylor, B., Broverman, S., & Ramanujam, N. (2020). Using human-centered design to connect engineering concepts to sustainable development goals. *Advances in Engineering Education*, 8(2), 1-24. [https://csu-mb.primo.exlibrisgroup.com/permalink/01CAL\\$UMB/r44bh4/cdi_crossref_primary_10_18260_3_1_1113_36015](https://csu-mb.primo.exlibrisgroup.com/permalink/01CAL$UMB/r44bh4/cdi_crossref_primary_10_18260_3_1_1113_36015)
- Reiser, R.A. (2018). What field did you say you were in? In R.A. Reiser & J.V. Dempsey (Eds.), *Trends and issues in instructional design and technology* (4th ed.) (pp. 1 - 7). Pearson Education, Inc.
- Robalewski, M. (2021). *Liberatory design: Mindsets and modes to design for equity*. Liberatory Design. <https://www.liberatorydesign.com/>
- Tekaatt, J.L., Anacker, H., & Dumitrescu, R. (2021). The paradigm of design thinking and systems engineering in the design of cyber-physical systems: A systematic literature review. *2021 IEEE International Symposium on Systems Engineering (ISSE)*, 1-8, DOI: 10.1109/ISSE51541.2021.9582548.