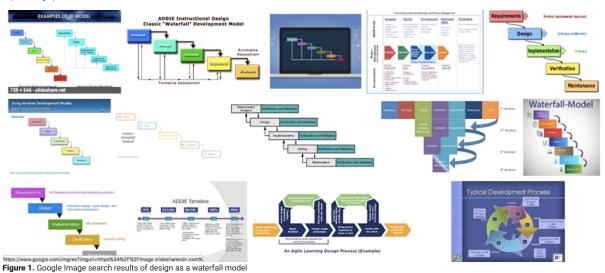
Design Thinking and Agile Design

New Trends or Just Good Design Practice?

Vanessa Svihla

While most instructional design courses and much of the instructional design industry focus on ADDIE (Analysis, Design, Development, Implementation, Evaluation), approaches such as design thinking, human-centered design, and agile methods like SAM (Successive Approximation Model), have drawn attention. This chapter unpacks what we know about design thinking and presents a concise history of design thinking to situate it within the broader design research field. It then traces its emergence in other fields. The chapter considers lessons for instructional designers and concludes by setting an agenda to address issues for scholarship, teaching, and practice.

Many depictions of design process, and a majority of early design learning experiences, depict design as rather linear, or "waterfall," view of design (Figure 1). This depiction was originally proposed as a flawed model in 1970 (Royce, 1970), yet it is still relatively common. It also contrasts with what researchers have documented as expert design practice.



Fortunately, as instructional and learning designers, we have many models and methods of design practice to guide us. **ADDIE** is ubiquitous and sometimes depicted as if it involves a specific set of steps that must be carried out in order. Yet, when we look at what experienced designers do, we find they tend to use **iterative** methods that sometimes appear a bit messy or magical, leveraging their past experiences as precedent. Perhaps the most inspiring approaches that reflect this are agile methods,

human-centered design, and design thinking. However, most of us harbor more than a few doubts and questions about these approaches, such as the following:

- Design thinking seems both useful and cool, but I have to practice a more traditional approach like ADDIE or waterfall. Can I integrate agile methods and design thinking into my practice?
- Design thinking—particularly the work by **IDEO**—is inspiring. As an instructional designer, can design thinking guide me to create instructional designs that really help neople?
- Given that design thinking seems to hold such potential for instructional designers, I want to do a research study on design thinking. Because it is still so novel, what literature should I review?
- As a designer, I sometimes get to the end of the project, and then have a huge insight about improvements. Is there a way to shift such insights to earlier in the
 process so that I can take advantage of them?
- If design thinking and agile design methods are so effective, why aren't we taught to do them from beginning?

To answer these questions, I explore how research on design thinking sheds light on different design methods, considering how these methods originated and focusing on lessons for instructional designers. I then share a case to illustrate how different design methods might incorporate design thinking. I close by raising concerns and suggesting ways forward.

What is Design Thinking?

There is no single, agreed-upon definition of design thinking. Further, there is not even agreement on what the outcomes might be if a designer is adept at design thinking (Rodgers, 2013). If we look at definitions over time and across fields (Figure 2), we notice most researchers reference design thinking as methods, practices or processes (Rowe, 1987). A few others reference cognition, mindset (ways of thinking), or values (e.g., practicality, empathy) (Cross, 1982). This reflects the desire to understand both what designers do and how and when they know to do it (Adams et al., 2011). In later definitions, design thinking is more clearly connected to creativity and innovation (Wylant, 2008); while mentioned in early design research publications (e.g., Buchanan, 1992), innovation was treated as relatively implicit.

Figure 2. A timeline of key developments in characterizations of design thinking (DT) across fields, authors, and over time (Brown, 2008; Cross et al., 1992; d.school, 2012; IDEO, 2011; Peirce Edition Project, 1998; Razzouk & Shute, 2012; Rodgers, 2013).

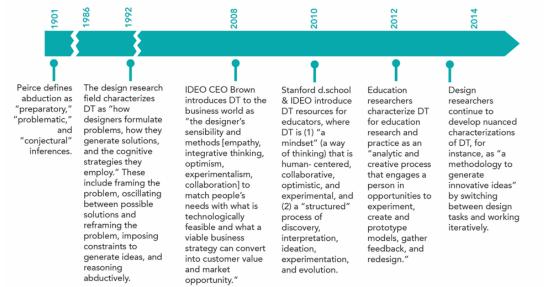


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Design thinking has only recently become a topic in instructional design and educational technology (Stefaniak & Xu, 2020). Indeed, we can identify four primary ways that design thinking has been used in prominent instructional design journals (i.e., *TechTrends, Educational Technology Research and Development, The British Journal of Educational Technology*, and *The Journal of Applied Instructional Design*) (Figure 3). Papers most commonly reference the IDEO approach as an aspirational practice for instructional design. Next, papers reference design thinking in order to investigate how instructional designers approach designing. Some papers reference the idea that teachers are designers who engage in design thinking; these papers tend to reference Chai et al. (2011), who define design thinking as "the mode of thinking which is concerned more with improving ideas into useful artefacts or processes rather than the belief mode of thinking which is predominantly concerned with the true value of knowledge claims" (p. 1191). Finally, a couple papers investigate design thinking as a learning outcome for students, typically in STEM. Thus, of the 35 papers that cite design thinking, about half use design thinking in line with the field that created the term, and about half reference the idea as popularized by IDEO. This suggests that the former may be more useful for those doing research, while the latter may provide inspiration to designers seeking alternatives to ADDIE. But let's take a more nuanced look at design thinking to consider how research on design thinking can also inspire practice.



Figure 3. Number of papers in prominent instructional design journals that cite design thinking.

Where Did Design Thinking Come From? What Does it Mean for Instructional Designers?

Design thinking emerged from the **design research** field ¹—an interdisciplinary field that studies how designers carry out their work. Initially, design thinking was proposed because of a desire to differentiate the work of designers from that of scientists. As Nigel Cross explained, "We do not have to turn design into an imitation of science, nor do we have to treat design as a mysterious, ineffable art" (Cross, 1999, p. 7). By documenting what accomplished designers do and how they explain their process, design researchers argued that while scientific thinking can be characterized as reasoning **inductively** and **deductively**, designers reason *abductively* (Dorst, 2011; Kolko, 2010).

When designers think abductively, they fill gaps in knowledge about the problem and about the kinds of solutions that can solve it, drawing inferences based on precedent—their past design work, their preferences, and experiences with designs—and on what they understand the problem to be.

LIDT in the World: Lesson #1

Research on design thinking should inspire us to critically consider how we use precedent to fill in gaps as we design. Precedent includes our experiences as learners, which may be saturated with uninspired and ineffective instructional design.

Example: Jeff and Paloma are instructional designers working with a client, Mr. Yazzie, who represents a coalition of tribal nations across the American Southwest. The coalition has requested a supplemental training on research ethics with Indigenous communities. Jeff's initial idea seamlessly matches the style of the existing training supplied by the Collaborative Institutional Training Initiative (CITI) program, consisting of text and multiple-choice questions. What precedent shapes both the CITI training and Jeff's idea?

A critical difference between scientific thinking and design thinking is the treatment of the problem. In scientific thinking, the problem is treated as solvable through empirical reasoning, whereas in design thinking, problems are tentative—sometimes irrational—conjectures (Diethelm, 2016). This type of thinking is suppositional, meaning the designer explores if-then and what-if scenarios to **iteratively** frame the problem (Dorst, 2011). As designers do this kind of work, they jointly frame the problem and pose possible solutions, checking to see if their solutions satisfy the identified requirements (Cross et al., 1992; Kimbell, 2012). From this point of view, we don't truly know what the design problem is until it is solved! This means that when doing design iteratively, we are changing the design problem multiple times. But how can we manage such changes efficiently? One answer is agile design.

Learning Check Which of the following best characterizes design thinking, as defined by the design research community? A sequence of steps (Empathize, Define, Ideate, Prototype, Test) that is an alternative to ADDIE Using inductive reasoning systematically Using abductive reasoning in framing and reframing problems Using deductive reasoning to fill in gaps in understanding

Agile design, with its emphasis on rapid prototyping, testing and iteration, was proposed to improve software design processes. Later canonized in the Manifesto for Agile Software Development (Beck et al., 2001), early advocates argued that this change in software design process was urgently needed in "the living human world" that was affected by "increasingly computer-based systems [...] while the existing discipline of software engineering has no way of dealing with this systematically" (Floyd, 1988, p. 25). With the influence of new technologies on educational settings, it was natural for instructional designers to look to software design for inspiration. Indeed, Tripp and Bichelmeyer introduced instructional designers to rapid prototyping methods while these same methods were still being developed in the software design field (1990). They explained that traditional ID models were based on "naive idealizations of how design takes place" (p. 43) and that ID practice already included similar approaches (e.g., formative evaluation and prototyping), suggesting that agile design could be palatable to instructional designers, particularly when the context or learning approach was relatively new or unfamiliar.

LIDT in the World: Lesson #2 for ID

Our use of instructional designs tends to be short-lived, making them subject to iteration and adaptation to meet emergent changes in learning needs, context, or learning goals. Each new solution is linked to a reframing of the problem. As agile designers, we can embrace this iteration agentively, reframing the problem as we work based on insights gained from testing early, **low fidelity prototypes** with **stakeholders**.

Example: Jeff and Paloma, uncertain whether Mr. Yazzie will prefer a training that matches the existing CITI training, develop five design ideas as hand-drawn sketches, annotated with notes. They share these with Mr. Yazzie and a few of the intended learners. In doing so, they realize that matching the CITI training holds some appeal for the learners, but Mr. Yazzie and the designers realize it seems unlikely to support the complex learning needs.

In addition to presenting annotated sketches, what do you think Jeff and Paloma did to reach an understanding with Mr. Yazzie that matching the CITI training might not suffice? In other words, how can designers bring their low-fidelity prototypes to life for clients and learners?

Imagine instead that the designers did not share any design ideas that matched the CITI training. How do you think Mr. Yazzie and the learners might have responded?

Sometimes, presented with low-fidelity prototypes, clients feel concern about the lack of professional quality. What do you think Jeff and Paloma did to avoid this?

As they are practiced, agile methods, including SAM (Allen, 2012), frequently involve stakeholders in the design process (Fox et al., 2008). Working contextually and iteratively can help clients see the value of a proposed design solution and understand better how—and if—it will function as needed (Tripp & Bichelmeyer, 1990). One challenge designers encounter is that stakeholders may react to sketches and prototypes in unexpected ways. They may think low fidelity versions are unprofessional, but may consider polished representations are more functional and finalized, and then be unsure about what can still be changed, and focus feedback on superficial or aesthetic aspects.

Other design methods that engage stakeholders early in the design process, such as participatory design (Muller & Druin, 1993; Schuler & Namioka, 1993) and human-centered design (Rouse, 1991), have also influenced research on design thinking. While these approaches differed in original intent, these differences have been blurred as they have come into practice. Instead of defining each approach, let's consider design characteristics made relevant by comparing them with more traditional methods like ADDIE, which as we have noted, is often depicted as a linear process. Like agile design, these methods tend to be iterative. Whereas in ADDIE, the designer is responsible for collecting information about stakeholders, in agile methods, designers tend to include stakeholders in more varied ways, even inviting stakeholders to generate possible design ideas and help frame the design problem.

When designing with stakeholders, we gain access to their perspectives and give them more ownership over the design. However, it can be difficult to help them be visionary. Consider early smartphone design. Early versions had keyboards and very small screens. Each new version was incrementally different from the prior version. If we had asked stakeholders what they wanted, most would have suggested minor changes in line with the kinds of changes they were seeing with each slightly different version. Likewise, traditional approaches to instruction should help inspire stakeholder expectations of what is possible in a learning design.

LIDT in the World: Lesson #3 for ID

Inviting stakeholders into instructional design process early can lead to more successful designs, but we should be ready to support them to be visionary while considering how research on how people learn might inform the design. For instance, rather than asking for improvements on known, existing designs, designers can inquire about other meaningful learning experiences that they value.

Example: Jeff and Paloma share the CITI training and ask Mr. Yazzie and the intended learners to describe what they would prefer in a training. Their ideas include making the CITI training more accessible, such as increasing the font size on the resources, adding more pictures, and creating offline versions.

Why might sharing an existing design, like the CITI training, prompt clients and learners to focus on incremental improvements?

Are these incremental improvements likely to result in a design that meets the learning needs?

Having asked for their participation, what are possible consequences of ignoring their ideas?

How could Jeff and Paloma have made better use of their time with Mr. Yazzie and the learners?

Designers who engage with stakeholders must also pay attention to **power dynamics** (Kim et al., 2012). As instructional designers, when we choose to include learners in the design process, they may be uncertain about how honest they can be with us. This is especially true when working with children or adults from marginalized communities or unfamiliar cultures. For instance, an instructional designer who develops a basic computer literacy training for women fleeing abuse may well want to understand more about learner needs, such as whether they need support with typical tasks like email, word processing, file management, and so forth, or more specific tasks, like using privacy settings on social media to reduce an abuser's access to information about these women. Equally important, the designer needs to know about contextual needs, like transportation, child care, and learning disabilities, that if not taken into account in the design process could result in a solution that fails to meet learning needs. In order to gather such information, the instructional designer should consider carefully the situations in which learners will feel safe sharing. A focus group coordinated by someone the women trust might be better than holding one-on-one interviews. The instructional designer could supplement the focus group with a survey or comment cards to collect ideas anonymously.

LIDT in the World: Lesson #4 for ID

With a focus on understanding human need, design thinking and agile methods should also draw our attention to inclusivity, diversity, justice, and participant safety

Example: Jeff, a white man, and Paloma, a Latina, both with graduate degrees, recognize that their experiences differ from the tribal members they are designing for. They acknowledge that a long history of oppression and injustice will likely make stakeholders cautious about sharing their thoughts and feelings. Because they don't trust their own precedent, they seek out information about Indigenous and decolonizing instructional design (DeLorme, 2018) and consult with Mr. Yazzie about the appropriateness of using a **talking circle** to gather stakeholder feedback. Mr. Yazzie is supportive because he has observed other outsiders take this approach. However, he advises them to allow him to identify a tribal member to lead the circle.

To further illustrate these design thinking practices in tandem, consider what design thinking might look like across different instructional design practices.

Learning Check

Which statement is most accurate regarding benefits and challenges designers encounter in agile and human centered design methods?

While stakeholders feedback ensures the design will meet the needs, it is more work overall.

Power dynamics can prevent stakeholders from engaging in the design process. By mitigating the impacts of power dynamics, designers are liklier to get honest feedback.

Stakeholders typically intuitively understand that sketches and low fidelity prototypes are intentionally drafty, so there is no need to set expectations about such representations.

Design Thinking in ID Practice

To understand how design thinking might play out in different instructional design methods, let's consider another case with the following four different instructional design practices:

- · Waterfall design proceeds in a linear, stepwise fashion, treating the problem as known and unchanging
- · ADDIE design, in this example, often proceeds in a slow, methodical manner, spending time stepwise on each phase
- · Agile design proceeds iteratively, using low fidelity, rapid prototyping to get feedback from stakeholders early and often
- · Human-centered design prioritizes understanding stakeholder experiences, sometimes co-designing with stakeholders

A client—a state agency—issued a call for proposals that addressed a design brief for instructional materials paired with new approaches to assessment that would "be worth teaching to." They provided information on the context, learners, constraints, requirements, and what they saw as the failings of current practice. They provided evaluation reports conducted by an external contractor and a list of 10 sources of inspiration from other states.

They reviewed short proposals from 10 instructional design firms. In reviewing these proposals, they noted that even though all designers had access to the same information and the same design brief, the solutions were different, yet all were *satisficing*, meaning they met the requirements without violating any constraints. They also realized that not only were there 10 different solutions, there were also 10 different problems being solved! Even though the client had issued a design brief, each team defined the problem differently.

The client invited four teams to submit long proposals, which needed to include a clear depiction of the designed solution, budget implications for the agency, and evidence that the solution would be viable. Members of these teams were given a small budget to be spent as they chose.

Team Waterfall, feeling confident in having completed earlier design steps during the short proposal stage, used the funds to begin designing their solution, hoping to create a strong sense of what they would deliver if chosen. They focused on details noted in the mostly positive feedback on their short proposal. They felt confident they were creating a solution that the client would be satisfied with because their design met all identified requirements; because they used their time efficiently; and because as experienced designers, they knew they were doing quality, professional design. Team Waterfall treated the problem as adequately framed and solved it without iteration. Designers often do this when there is little time or budget², or simply because the problem appears to be an another-of problem—thinking, "this is just another of something I have designed before." While this can be an efficient way to design, it seldom gets at the problem behind the problem, and does not account for changes in who might need to use the designed solution or what their needs are. Just because Team Waterfall used a more linear process does not mean that they did not engage in design thinking. They used design thinking to frame the problem in their initial short proposal, and then again as they used design precedent—their past experience solving similar problems—to deliver a professional, timely, and complete solution.

Team ADDIE used the funds to conduct a traditional needs assessment, interviewing five stakeholders to better understand the context, and then collecting data with a survey they created based on their analysis. They identified specific needs, some of which aligned to those in the design brief and some that demonstrated the complexity of the problem. They reframed the problem and created a low fidelity prototype. They did not have time to test it with stakeholders, but could explain how it met the identified needs. They felt confident the investment in understanding needs would pay off later, because it gave them insight into the problem. Team ADDIE used design thinking to fill gaps in their understanding of context, allowing them to extend their design conjectures to propose a solution based on a reframing of the design problem.

Team Agile used the budget to visit three different sites overseen by the state agency. They shared a low fidelity prototype with multiple stakeholders at the first site. In doing so, they realized they had misunderstood key aspects of the problem from one small but critical stakeholder group. They revised both their framing of the problem and their idea about the solution significantly and shared a revised prototype with stakeholders at the remaining sites. They submitted documentation of this process with their revised prototype. In their work, Team Agile prioritized iteration and diversity of point of views. They committed to treating their solution ideas as highly tentative, but gave stakeholders something new and different to react to. This strategy helped the team reframe the problem, but could have failed had they only sought feedback on improvements, rather than further understanding of the problem. They used design thinking to reframe their understanding of the problem, and this led them to iterate on their solution. Design researchers describe this as a co-evolutionary process, in which changes to the problem framing affect the solution, and changes to the solution affect the framing (Dorst & Cross, 2001).

Team Human-centered used the budget to hold an intensive five-day co-design session with a major stakeholder group. Stakeholders shared their experiences and ideas for improving on their experience. Team Human crafted three personas based on this information and created a prototype, which the stakeholder group reviewed favorably. They submitted this review with their prototype. Team Human-centered valued stakeholder point of view above all else, but failed to consider that an intensive five-day workshop would limit who could attend. They used design thinking to understand differences in stakeholder point of view and reframed the problem based on this; however, they treated this as covering the territory of stakeholder perspectives. They learned a great deal about the experiences these stakeholders had, but failed to help the stakeholders think beyond their own experiences, resulting in a design that was only incrementally better than existing solutions and catered to the desires of one group over others.

The case above depicts ways of proceeding in design process and different ways of using design thinking. These characterizations are not intended to privilege one design approach over others, but rather to provoke the reader to consider them in terms of how designers fill in gaps in understanding, how they involve stakeholders, and how iteratively they work. Each approach, however, also carries potential risks and challenges (Figure 4). For instance, designers may not have easy access to stakeholders, and large projects may make agile approaches unwieldy to carry out (Turk et al., 2002).

Solution is Never gets creative but no finished one wants it **Emphasis** on iteration Meets needs of dominant group, but not others; may even increase harm to other groups Meets superficial needs Does not meet or is an incremental, Meets deadline needs because uninspired change to but does not power dynamic previous solutions meet actual needs not attended to

Amount of stakeholder participation in design process

Figure 4. Risks and pitfalls associated with different levels of stakeholder participation and iteration

Critiques of Design Thinking

While originally a construct introduced by design researchers to investigate how designers think and do their work, design thinking became popularized as a set of methods, first in the business world (Brown, 2008) and later in education. Given this popularity, design thinking was bound to draw critique in the public sphere. To understand these critiques, it is worth returning to the definitions cited earlier (Figure 2). Definitions outside of the design research field tend to be based in specific techniques and strategies aimed at innovation; such accounts fail to capture the diversity of actual design practices (Kimbell, 2011). They also tend to privilege the designer as a savior, an idea at odds with the keen focus on designing with stakeholders, a practice that is central in the design research field (Kimbell, 2011). As a result, some have raised concerns that design thinking can be a rather privileged process—e.g., upper middle class white people drinking wine in a museum while solving poverty with sticky note ideas—that fails to lead to sufficiently multidimensional understandings of complex processes (Collier, 2017). Still others argue that much of design thinking is nothing new (Merholz, 2009), to which researchers in the design research field have responded: design thinking, as represented externally might not be new, but the rich body of research from the field can inform new practices (Dorst. 2011).

These critiques should make us cautious about how we, as instructional designers, take up design thinking and new design practices. Below, I raise a few concerns for new instructional designers, for instructional designers interested in incorporating new methods, for those who teach instructional design, and for those planning research studies about new design methods.

My first concern builds directly on critiques from the popular press and my experience as a reviewer of manuscripts. Design thinking is indeed trendy, and of course people want to engage with it. But as we have seen, it is also complex and subtle. Whenever we engage with a new topic, we necessarily build on our past understandings and beliefs as we make connections. It should not be surprising, then, that when our understanding of a new concept is nascent, it might not be very differentiated from previous ideas. Compare, for example, Pólya's "How to Solve it" from 1945 to Stanford's d.school representation of design thinking (Table 2). While Pólya did not detail a design process, but rather a process for solving mathematics problems, the two processes are superficially very similar. These general models of complex, detailed processes are zoomed out to such a degree that we lose detail. These details matter, whether you are a designer learning a new practice or a researcher studying how designers do their work. For those learning a new practice, I advise you to attend to the differences, not the similarities. For those planning studies of design thinking, keep in mind tha "design thinking" is too broad to study effectively as a whole. Narrow your scope and zoom in to a focal length that lets you investigate the details. As you do so, however, do not lose sight of how the details function in a complex process. For instance, consider the various approaches being investigated to measure design thinking; some treat these as discrete, separable skills, and others consider them contextualized to the particular process and as occurring in iterative or overlapping ways (Carmel-Gilfilen & Portillo, 2010; Dolata et al., 2017; Lande et al., 2012; Razzouk & Shute, 2012).

Pólya, 1945 How to solve it	Stanford's d.school design thinking representation
Understand the problem	Empathize, Define
Devise a plan	Ideate
Carry out the plan	Prototype
Look back	Test

Table 2. Similarities between "How to Solve it" and a representation of design thinking

My second concern is that, as a field, we tend to remain naïve about the extant and extensive research on design thinking and other design methods in part because many of these studies were conducted in other design fields (e.g., architecture, engineering) and published in journals such as *Design Studies* (which has seldom referenced instructional design). Not attending to past and current research, and instead receiving information about alternative design methods filtered through other sources is akin to the game of telephone. By the time the message reaches us, it can be distorted. While we need to adapt alternative methods to our own ID practices and contexts, we should do more to learn from other design fields, and also contribute our findings to the design research field. As designers, we would do well to learn from fields that concern themselves with human experience and focus somewhat less on efficiency.

My third concern is about teaching alternative design methods to novice designers. The experience of learning ID is often just a single pass, with no or few opportunities to iterate. As a result, agile methods may seem the perfect way to begin learning to design, because there is no conflicting traditional foundation to overcome. However, novice designers tend to jump to solutions too quickly—a condition no doubt brought about in part by an emphasis in schooling on getting to the right answer using the most efficient method. Methods like agile design encourage designers to come to a tentative solution right away, then get feedback by testing low fidelity prototypes. This approach could exacerbate a new designer's tendency to leap to solutions. And once a solution is found, it can be hard to give alternatives serious thought. Yet, I argue

that the solution is not to ignore agile and human-centered methods in early instruction. By focusing only on ADDIE, we may create a different problem by signaling to new designers that the ID process is linear and tidy, when this is typically not the case.

Instead, if we consider ADDIE as a scaffold for designers, we can see that its clarity makes it a useful set of supports for those new to design. Alternative methods seldom offer such clarity, and have far fewer resources available, making it challenging to find the needed supports. To resolve this, we need more and better scaffolds that support novice designers to engage in agile, human-centered work. For instance, I developed the *Wrong Theory Design Protocol* (http://www.vanessasvihla.org/wrong-theory-protocol.htm) (Svihla & Kachelmeier, 2022) that helps inexperienced designers get unstuck, consider the problem from different points of view, and consider new solutions. Such scaffolds could lead to a new generation of instructional designers who are better prepared to tackle complex learning designs, who value the process of framing problems with stakeholders, and who consider issues of power, inclusivity, and diversity in their designing.

Concluding Thoughts

I encourage novice instructional designers, as they ponder the various ID models, practices and methods available to them, to be suspicious of any that render design work tidy and linear. If, in the midst of designing, you feel muddy and uncertain, unsure how to proceed, you are likely exactly where you ought to be.

In such situations, we use design thinking to fill in gaps in our understanding of the problem and to consider how our solution ideas might satisfy design requirements. While experienced designers have an expansive set of precedents to work with in filling these gaps, novice designers need to look more diligently for such inspiration. Our past educational experiences may covertly convince us that just because something is common, it is best. While a traditional instructional approach may be effective for some learners, I encourage novice designers to consider the following questions to scaffold their evaluation of instructional designs:

- Does its effectiveness depend significantly on having compliant learners who do everything asked of them without questioning why they are doing it?
- Is it a design worth engaging with? Would you want to be the learner? Would your mother, child, or next-door neighbor want to be? If yes on all counts, consider who wouldn't, and why they wouldn't.
- Is the design, as one of my favorite project-based teachers used to ask, "provocative" for the learners, meaning, will it provoke a strong response, a curiosity, and a desire to know more?
- Is the design "chocolate-covered broccoli" that tricks learners into engaging?

To be clear, the goal is not to make all learning experiences fun or easy, but to make them worthwhile. And I can think of no better way to ensure this than using iterative, human-centered methods that help designers understand and value multiple stakeholder perspectives. And if, in the midst of seeking, analyzing, and integrating such points of view, you find yourself thinking, "This is difficult," that is because it is *difficult*. Providing a low fidelity prototype for stakeholders to react to can make this process clearer and easier to manage, because it narrows the focus.

However, the success of this approach depends on several factors. First, it helps to have forthright stakeholders who are at least a little hard to please. Second, if the design is visionary compared to the current state, stakeholders may need to be coaxed to envision new learning situations to react effectively. Third, designers need to resist the temptation to settle on an early design idea.

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Finally, I encourage instructional designers—novice and expert alike—to let themselves be inspired by the design research field and human-centered approaches, and then to give back by sharing their design work as design cases (such as in the <u>International Journal of Designs for Learning</u>) and by publishing in design research journals.

Resources in the Design Research Field

Want to know more about the Design Research field so you can contribute or locate resources?

The Design Society publishes several relevant journals:

- Design Science
- <u>CoDesign: International Journal of CoCreation in Design and the Arts</u>
- International Journal of Design Creativity and Innovation
- · Journal of Design Research

The Design Research Society (DRS) has conferences and discussion forums.

There are other prominent journals in the design research field:

- <u>Design Studies</u>, <u>1979-2023</u> (Note: In July 2023, the journal editors resigned in protest over changes made by the publisher that threatened the quality; the <u>DRS</u> has plans to develop a new journal)
- <u>Design Issues</u>
- The Design Journal
- She Ji: The Journal of Design, Economics, and Innovation
- Design and Culture

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- ¹ For those interested in learning more, refer to the journal, *Design Studies*, and the professional organization, *Design Research Society*. Note that this is not a reference to educational researchers who do design-based research, which is sometimes, confusingly, referred to as "design research."
- ² Waterfall might also be used when designing a large, expensive system that cannot be tested and iterated on as a whole and when subsystems cannot easily or effectively be prototyped.





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