

The Design Problem Revisited

Dina Lutfi

“I make solutions nobody wants to problems that don’t exist.”

Alvin Lustig

Introduction

The words “problem” and “solution” are commonly used across different design disciplines, such as graphic design, industrial design, and architectural design. Often overlooked—in theory and in practice—are the reasons designers resort to defining design as “problem solving” and the effect such terminology can have on perceptions of design professions by designers and nondesigners.¹

As a graphic designer and educator, I am interested in how people—including my college graphic design students—define design. At the beginning and end of every semester, for the past four years, I have asked students to write down their responses to the question “What is design?” (see Figures 1–4). The answers are often diverse, but to my surprise, many of the students use similar language. More specifically, “problem” and “solution” are among the most prominent words in their responses. Educators, practitioners, and writers also use this terminology, which presents an invitation to revisit where the notion of problem solving in design originated, whether it is reasonable to use and propagate terms such as “problem solving” in design, and if solving problems accurately delineates design activities.

Fields such as graphic design use creative tools for developing visual communication in different subject matter. Therefore, it is problematic to confine any area of design to “problem solving,” because it may also describe what many nondesigners do in everyday life.² Although my educational and professional backgrounds focus on visual communication, the aim of this article is to investigate the different ways the “design as problem-solving model” can be inaccurate in relation to the field in general. I also argue thinking about, practicing, and teaching design beyond the scope of problems and solutions.

The Problem with the Term “Problem”

The premise of any design problem is problematic.³ According to Kenneth Fitzgerald, “One of the great tropes of Modernism was the injection of the rhetoric of ‘problem-solving’ into graphic design—of self-importance and officiousness. It is still something that is

1 Carl Steinitz, “Design Is a Verb; Design Is a Noun,” *Landscape Journal* 14, no. 2 (1995): 188–200.

2 John Joseph Weir, “Problem Solving Is Everybody’s Problem,” *Science Teacher* 41, no. 4 (1974): 16–18.

3 Nigel Cross, “Designerly Ways of Knowing: Design Discipline versus Design Science,” *Design Issues* 17, no. 3 (Summer 2001): 49–55.

Figure 1

A sample of first-year college students' responses from 2021/2022 to the question "What is design?" The responses were brief. Fifty-two percent of students used the words "problem" and "solution." Source: Author.

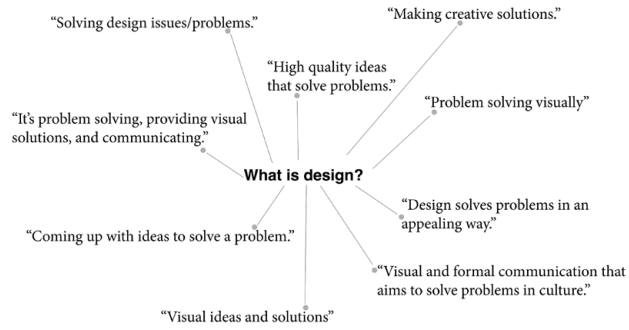


Figure 2

A sample of sophomore college students' responses from 2021/2022 to the question "What is design?" Sixty-three percent responded using similar language to the first-year students. Source: Author.

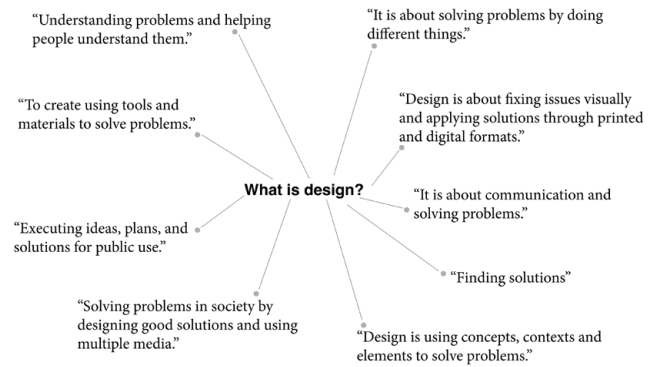


Figure 3

A sample of junior college students' responses from 2021/2022 to the question "What is design?" Seventy-seven percent of the students gave more detailed responses, which included the use of the terms "problems" and "solutions." Source: Author.

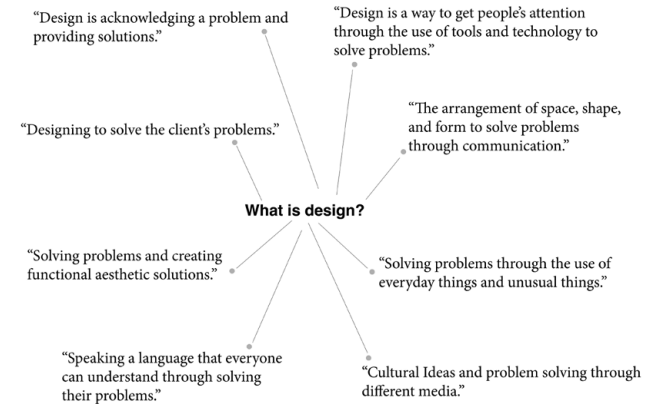
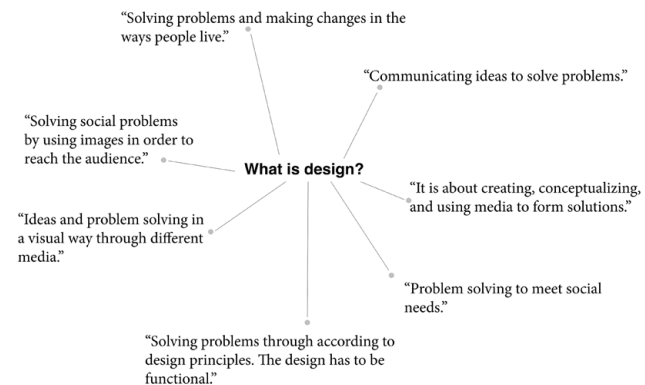


Figure 4

A sample of senior college students' responses from 2021/2022 to the question "What is design?" Ninety percent of students used the terms "problems" and "solutions." Source: Author.



highly prevalent in the discourse.”⁴ The notion of the design problem emanates from the word “design.” One reason the discipline is described as solving problems is related to semantics; the word “design” can be a verb (process) or a noun (the outcome of that process); respectively, design “is to mark out; to plan, purpose, intend,” or “a plan conceived in the mind, of something to be done,” and an “adaptation of means to end.”⁵ Norman Potter defines design as a process that requires thinking in certain contexts to achieve an outcome that is meaningful and useful. Thus, design can be perceived as based in communication and utility—not necessarily problem-based.⁶

Design as problem solving also has roots in design processes, due to their dependence on intention and systematic planning; when there is a plan in place, a solution is expected. Nevertheless, the idea of design problems not only emerged from the definition of the word “design” but also resulted from the lack of value placed on design as a field by other disciplines and professions.⁷ World-renowned designer Dieter Rams once professed, “I am troubled by the devaluing of the word ‘design.’ I find myself now being somewhat embarrassed to be called a designer. In fact I prefer the German term, *Gestalt-Ingenieur*.”⁸ He strongly suggests that defining design in a formulaic manner such as problem solving was a coping mechanism for gaining the respect of other professions. Consequently, defining design as a problem-solving discipline has been based on the intention of portraying the field as functional and rigorous to distinguish it from purely artistic endeavors. Design professionals may find other ways to define design, but because problems will always exist in the world, defining design as problem solving renders design activities more relatable or understandable to nondesigners.⁹

How designers choose to present and re-present their professions is reflected in what they make and in the many ways design is positioned in thought and action. A significant piece that may be missing from the definition of design is that its outcomes are not purely the realization of solutions; they are forms of deliberation in and of themselves. Victor Margolin once said, “Not to recognize this has been the mistake of many designers whose work is marginalized by the culture because it is ultimately seen as visual form and not communication.”¹⁰ Although Margolin’s statement was referring specifically to graphic design, it is relevant to other disciplines. Design work that is overlooked may lead to a reframing of its purpose and function through language that is appealing to stakeholders and other professions but essentially misleading. In other cases, design as problem solving can emerge from working with clients who present the design brief as a problem. As Rob Peart explains, “Not a week of my life passes in which I don’t get a brief presented as a

4 Kenneth FitzGerald, “Huh? #29: An Interview with Kenneth FitzGerald,” *Perpetual Beta*, March 8, 2016 (accessed January 13, 2023), <https://perpetualbeta.vcfa.edu/2016/03/08/huh-29-an-interview-with-kenneth-fitzgerald/>.

5 Norman Potter, “What Is a Designer?,” in *What Is a Designer: Things, Places, Messages* (London: Hyphen Press, 2002), 10.

6 Richard Buchanan, “Declaration by Design: Rhetoric, Argument, and Demonstration in Design Practice,” *Design Issues* 2, no. 1 (Spring 1985): 4–22.

7 Heather C. Vough, M. Teresa Cardador, Jeffrey S. Bednar, Erik Dane, and Michael G. Pratt, “What Clients Don’t Get about My Profession: A Model of Perceived Role-Based Image Discrepancies,” *Academy of Management Journal* 56, no. 4 (2013): 1050–80.

8 Matt Warman, “Dieter Rams: Apple has Achieved Something I Never Did,” *Telegraph*, June 7, 2011, <https://www.telegraph.co.uk/technology/apple/8555503/Dieter-Rams-Apple-has-achieved-something-i-never-did.html>.

9 Claire Blackshaw, “Opinion: Respecting Design,” *Game Developer*, June 14, 2011, <https://www.gamedeveloper.com/design/opinion-respecting-design>.

10 Victor Margolin, “The Age of Communication: A Challenge to Designers,” *Design Issues* 10, no. 1 (Spring 1994): 69.

problem, or see a case study presenting a solution, or read a newspaper article discussing the virtues of putting designers at the heart of business in order improve ... 'things.'"¹¹ Moreover, designers' discussions about how a product or outcome will definitely improve the quality of life can directly and indirectly propagate the notion that design is about problem solving. From an educator's perspective, it is noticeable that students evaluate the quality of their projects from the standpoint of the solution's aesthetic efficacy rather than the wider impact it could have on the audience or user. Designers can lose sight of why a project is being designed in the first place because the result has become more important than the process.

What Is a Problem?

There are two main characteristics of a problem according to David Jonassen. First, a problem is something that is unknown in a particular situation, which can vary from mathematical to complex social problems. Second, solving for any unknown should have intellectual, social, or cultural value; in other words, someone believes that the unknown is worth finding. "If no one perceives an unknown or a need to determine an unknown, there is no perceived problem."¹² Finding the unknown is the process of problem solving; thus, it can be "any goal-directed sequence of cognitive operations," however, there needs to be an actual perceived concrete problem to solve in the first place.¹³

Problems differ in their structure, variability, and complexity. There are parameters of what constitute a problem but also detailed dimensions, such as the problem type, problem representation, and individual differences.¹⁴ In other words, "Problem solving is not a uniform activity. Problems are not equivalent, in content, form, or process."¹⁵ A definition of design Gordon Rowland put forth describes a problem as a "disciplined inquiry engaged in for the purpose of creating some new thing of practical utility. It involves exploring an ill-defined situation, finding—as well as solving—a problem, and specifying ways to effect change."¹⁶ Definitions of design vary from one person to the next because of the field's evolving nature. "Using problems as a lens for design is convenient because there isn't a common understanding of what design is."¹⁷ People involved in design disciplines may realize that visual studies do not recognize the significant "role of design as a shaper of the visual environment alongside other acknowledged types or forms of visual culture such as film, television, advertising, and new media."¹⁸

The approaches we use in different design activities eventually influence how we describe the outcomes and vice versa. Terms like "persuade" and "entertain" represent what outcomes can mean to different designers. Prescribing valuations to design is another

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- 11 Rob Peart, "Why Design Is Not Problem Solving + Design Thinking Isn't Always the Answer," *Eye on Design*, May 27, 2017, <https://eyeondesign.aiga.org/why-design-is-not-problem-solving-design-thinking-isnt-always-the-answer/>.
- 12 David H. Jonassen, "Toward a Design Theory of Problem Solving," *Educational Technology Research and Development* 48, no. 4 (2000): 64.
- 13 John R. Anderson, "Pattern Learning and Memory," in *Cognitive Psychology and Its Implications* (New York: Worth, 1980), 257.
- 14 David H. Jonassen, "Toward a Design Theory of Problem Solving," *Educational Technology Research and Development* 48, no. 4 (2000): 72.
- 15 Jonassen, "Toward a Design Theory," 64.
- 16 Gordon Rowland, "Designing and Instructional Design," *Educational Technology Research and Development* 41, no. 1 (1993): 79–91, <http://www.jstor.org/stable/30218372>.
- 17 Peart, "Why Design Is Not Problem Solving."
- 18 Rick Poynor, "Out of the Studio: Graphic Design History and Visual Studies," *Design Observer*, January 10, 2011, <https://designobserver.com/feature/out-of-the-studio-graphic-design-history-and-visual-studies/24048>.

common example of language's connection to design activities, when a design is noteworthy aesthetically and functionally designers will call it "good design." When it does not meet expectations, it is unsatisfactory and is labeled as "bad design." However, "bad design" can be an important strategy for moving away from the problem-solution model because it has become an alternative design thinking tool that offers participants opportunities to "defy the conventional design process to arrive at a favorable output, often termed as good design."¹⁹

To declare a problem as solved is another way of saying it is an open-and-shut case. Horst Rittel and Melvin Webber have explained that to solve a problem completely, one would need to conceive of all the outcomes of a process.²⁰ Characterizing design as problem solving implies only one ideal solution to the problem. The different definitions of design have also led to the development of myths, some of which Victor Papanek highlighted in *Edugraphology*:²¹

- The myth that design solves problems. It does so sometimes, but the problems are usually "self-generated." A graphic designer solves problems by raising awareness, directing attention, promotion, and persuasion. It is more of a guided solving of problems than actually changing the world directly or in a moment.
- The myth that design satisfies needs. It does to some extent, but at what social cost? The needs that are satisfied can sometimes be invented ones.
- There is also the myth that design is time-related. Plenty of design is concerned with creating something useful, but design outcomes are constantly at risk of becoming obsolete. Is design ever for permanence, and therefore can it find definite and lasting solutions to problems?

Advantages and Disadvantages of the Design Problem-Solution Model

Problem solving is normally perceived as a significant cognitive activity professionally and in everyday life. As Jonassen explains, many people are asked to solve problems and are rewarded for doing so.²² Even in educational settings, some educators regard the main purpose of education as preparing students to be better problem solvers; this, in part, is because few professionals receive rewards for simply memorizing information.²³ But students rarely solve meaningful real-world problems during their education; the problems they encounter are normally structured to fit lesson plans and can be inconsistent with those of daily life.

19 Srishti Garg, "What Makes a Bad Design?," *UX Collective*, September 29, 2020, <https://uxdesign.cc/what-makes-a-bad-design-302d1ca76185>.

20 Horst W. J. Rittel and Melvin M. Webber, "Dilemmas in a General Theory of Planning," *Policy Sciences* 4, no. 2 (1973): 155–69.

21 Victor Papanek, "Edugraphology—The Myths of Design and the Design of Myths," *Icographic*, no. 9 (1975).

22 Jonassen, "Toward a Design Theory," 63.

23 Robert M. Gagné, *The Conditions of Learning* (New York: Holt, Rinehart & Winston, 1977).

Wolfgang Köhler proclaims that a person's prior learning or education plays an essential role not only in solving a problem but also in recognizing that it is a problem to begin with.²⁴ The concept of problem finding is constant in lessons about research methodology. University students are taught about research by first finding a problem, formulating a problem statement, answering a question through research, and solving the specified initial problem.²⁵ But problem solving has not been adequately acknowledged in instructional design literature, with only a few rare occurrences in some textbooks. The publications that discuss problem solving do so in a general manner unrelated to the field of design.²⁶

On the other hand, Rob Peart explains that the term "problem solving" can be useful in design because it offers a framework that aids in structuring the design process. It can give direction to inquiry by asking specific questions: Whose problem is this? What are the contributing factors? What are some possible solutions? It offers a scale against which designers can measure the "ideal" solution.²⁷ Matt Wade provided a clear definition for design that does not involve the words "problem" or "solution": design is "just a way of interrogating relationships and acting upon them with an agenda."²⁸ "Design," as mentioned earlier, can be a noun or verb, which entails actionable processes and creative outcomes. For some who are faced with providing a more concrete definition of design, problem solving may be theoretically appealing, but it is debatable whether it is actually a considerable part of design. Problems can be solved in numerous calculated ways; however, design activities do not depend on continuous calculation. "Designing requires a balance of reason and intuition, an impetus to act, and an ability to reflect on actions taken."²⁹ A narrow focus on problem solving takes for granted the process a designer undergoes to arrive at an outcome. The design contexts and the goal lead designers down the path of realizing something new.³⁰ Designers are meant to continuously interpret information and reflect on it to create outputs that best meet people's needs. This responsibility is often overlooked in favor of quick ideal answers.

The Complexities of Design Problems

Designers are often members of organizations that consist of other entities: financial departments, human resources, and strategy teams. The "problems" that need solving are positioned in a whirlwind of culture, governmental regulations, and economics, which can all have a large effect on how designers work. In other words, they are situated front and center in a plexus of various decision makers affecting the process of arriving at an end product. Therefore, even if

24 Wolfgang Köhler, *The Task of Gestalt Psychology* (Princeton, NJ: Princeton University Press, 1969), 163.

25 Carter V. Good, "Methods of Research and Problem Solving in Education," *Journal of Educational Research* 34, no. 2 (1940): 81–89.

26 Jonassen, "Toward a Design Theory," 64.

27 Peart, "Why Design Is Not Problem Solving."

28 Ibid.

29 Rowland, "Designing and Instructional Design," 80.

30 Kees Dorst and Nigel Cross, "Creativity in the Design Process: Co-Evolution of Problem-Solution," *Design Studies* 22, no. 5 (2001): 42.

designers recognize that other stakeholders are involved, the term “problem solving” limits the possibilities of what designers can achieve. Simultaneously, “creating intellectual problem packages to be solved” may result in a curtailed responsibility “for the actions we take in the name of our clients.”³¹

David Rudnick explains, “Design has lost sight of the difference between offering solutions to the audience and solutions to the client.”³² From Rudnick’s point of view, industry dialogue has shifted the practice of design to “the practice of offering solutions to the problems of the client.” There is a need to persuade audiences that the final design outcome represents characteristics they find desirable when there is no structural representation of a solution that suits the audience’s needs.³³ Rudnick also argues that designers’ approaches to problem solving can be disingenuous. His point is valid; when working with a paying client, are designers certain they are solving real problems and not invented ones?

Deeper interest in design thinking as strategic and practical approaches has shifted the focus from aesthetics to problem solving.³⁴ Problems are not always clear-cut or easily identified. Rittel formulated the wicked problems approach in the 1960s, when diverse design methodologies were being explored.³⁵ As an expert in mathematics, design, and education, Rittel was interested in approaching design differently from the “linear, step-by-step model of the design process being explored by many designers and design theorists.”³⁶ The linear model categorized the design process into two specific phases: problem definition and problem solution. Problem definition is a series of analytic steps in which the designer pinpoints the elements of a problem and decides on the requirements that would lead to a successful solution. The problem solution is a “synthetic sequence” consisting of different requirements that are combined and synthesized, resulting in a blueprint that leads to a final product.³⁷ Theoretically, the linear model presents itself as precise, logical, and objective while appealing to designers and nondesigners, such as scientists and business professionals. However, critics of this model argue that it is weak for two reasons. First, design thinking and decision making during the design process are not linear or formulaic.³⁸ Second, the problems that designers encounter in practice do not result in linear analysis and synthesis. Rittel describes the problems that designers tackle as wicked problems, a “class of social system problems which are ill-formulated, where the information is confusing, where there are many clients and decision makers with conflicting values, and where the ramifications in the whole system are thoroughly confusing.”³⁹ Nevertheless, his description sums up the kinds of problems designers face whenever they design something. As Richard Buchanan points out, it sheds light on a deeper issue behind

31 Peart, “Why Design Is Not Problem Solving.”

32 Ibid.

33 Ibid.

34 Dennis Hambeukers, “Design Is More than Problem Solving,” *Medium, Design Leadership Notebook*, December 20, 2020, <https://medium.com/design-leadership-notebook/design-is-more-than-problem-solving-7e290535927c>.

35 Charles W. Churchman, “Guest Editorial: Wicked Problems,” *Management Science* 14, no. 4 (1967): B141–42.

36 Richard Buchanan, “Wicked Problems in Design Thinking,” *Design Issues* 8, no. 2 (Spring 1992): 15.

37 Buchanan, “Wicked Problems,” 15.

38 Rittel and Webber, “Dilemmas in a General Theory of Planning.”

39 Charles W. Churchman, “Wicked Problems,” *Management Science* 14, no. 4 (1967): B141.

the design practice: “the relationship between *determinacy* and *indeterminacy* in design thinking.”⁴⁰ Buchanan also argues, “The linear model of design thinking is based on determinate problems which have definite conditions.”⁴¹ It is then in the designer’s hands to identify those conditions and arrive at a solution. On the other hand, the wicked problems approach hints at the existence of an underlying “indeterminacy” in most design problems, except for the ones where, as Rittel suggests, the “wickedness” has already been taken out to shape more determinate problems. There is a difference between “indeterminacy” and “undetermined.” The term “indeterminate” suggests that specific restrictions and limitations do not exist when it comes to design. Buchanan argues that design problems are “wicked” and “indeterminate” because their design does not consist of its own subject matter—only the subject matter the designer envisions it to be. Design could be an innovative teacup, an avant-garde layout for a publication, or even a building inspired by a historic period. The subject matter that exists in design is limitless in scope because it deals with any facet of being human.

During the design process, the designer discovers or creates a subject matter from “problems” or other contexts. This presents a contrast with scientific disciplines, which are centered on structures of law, rules, and formulas that are present in more precise subject matters.⁴² On the other hand, design’s subject matter comes into fruition in two ways: “general and particular.”⁴³ With regard to the general level, designers come up with an idea concerning what is human-related in the world; they are proficient at explaining design’s subject matter in a general sense. The thoughtful explanations designers provide offer a plurality of views. But they are also an integral structure for designers to explore with techniques, materials, and design thinking tools. However, these philosophies and points of view do not form design sciences in the same way that social or natural sciences are formulated. “The reason for this is simple: design is fundamentally concerned with the particular, *and there is no science of the particular.*”⁴⁴

Design is subject to varied intents and interpretations—theoretically and in practice. Nevertheless, design’s adaptability causes confusion, and without a clearer and more accurate understanding of design, its meaning and applications will continuously be misconstrued.⁴⁵

In a similar line of thought to wicked problems, Kees Dorst discusses design “situated problem solving.” One aspect to consider in situated problem solving is subjectivity: “the design problem as seen through the eyes of the designer, the design situation.”⁴⁶ Designers tend to concentrate on an exclusive part of a problem and regard the overarching design problem as a vague concept. The

40 Buchanan, “Wicked Problems,” 15.

41 Ibid.

42 Ibid., 16.

43 Ibid., 17.

44 Ibid.

45 Ibid., 19.

46 Kees Dorst, “Design Problems and Design Paradoxes,” *Design Issues* 22, no. 3 (Summer 2006): 11.

design solution model is indistinctive and subjective; it is built on clusters of curated and mostly invented issues presented in a design brief. Businesses and clients that have predetermined solutions in mind to be executed based on specifications are often the ones hiring designers. Such design projects typically solve business issues. In addition, the combinations of problems designers encounter in the design process are reinterpreted and framed further by the designer. In other cases, if there is never a complete picture of a design problem presented, designers will resort to subjectively investigating elements in the design situation.⁴⁷ The incompleteness and subjective nature of this local network of problems means there needs to be a model of how designers approach a problem, which is not feasible because problems are indeterminate.

From another point of view, theorists see the term “problem solving” through a lens that does not enforce finding a single solution to a problem. Armand Hatchuel, for example, perceives problem solving as an unforced part of the design process. Hatchuel also emphasizes the need for a recognizable difference between design and problem solving through three main points. First, any design situation needs a beginning stage that includes a context framed through “initial concepts.” In this case, the design process is geared toward a “project” instead of a “problem.” There is no dominant solution for what any design outcome should be, “so imagination needs to be applied at this very fundamental level.”⁴⁸ Second, every design situation necessitates the use of “learning devices” to arrive at solutions. These devices are components of the processes that help designers achieve the best possible options for outcomes culminating from exploration and experimentation. Third, during the design process, designers usually consider designing to be both an outcome and a “social interaction.” This connects to Louis Bucciarelli’s proclamation: “Design is fundamentally a social process.”⁴⁹ These three points characterize design as addressing problems that are ill-structured while also being concerned with more prominent facets of life. In *The Sciences of the Artificial*, Herbert Simon describes what makes design distinctive is that it is a “satisfying” activity where decisions are sometimes made without complete information and the acceptance of outcomes that are good enough rather than “optimizing” a finite solution. Simon’s description highlights a prominent asset in design processes, which is their open-ended potential.⁵⁰ An alternative way of explaining design is described as follows:

The designer often telescopes a mass of fragmented bits of information and then usually—after a period of incubation—invents a coherent and often elegant proposition that embodies all or most of the rag-bag of bits. Fletcher describes the “search, discovery, recognition, and evaluation” in research terms, but calls it an intuitive process that can be accessed in any order.⁵¹

47 Dorst, “Design Problems,” 11.

48 Armand Hatchuel, “Towards Design Theory and Expandable Rationality: The Unfinished Program of Herbert Simon,” *Journal of Management and Governance* 5, no. 3 (2002): 260–73.

49 Louis L. Bucciarelli, *Designing Engineers* (Cambridge, MA: MIT Press, 1994).

50 Hebert A. Simon, *The Sciences of the Artificial* (Cambridge, MA: MIT Press, 1996).

51 Cal Swann, “Action Research and the Practice of Design,” *Design Issues* 18, no. 1 (Winter 2002), 54.

Moving Beyond the Design Problem-Solution Approach

At the end of the nineteenth century, philosophers such as William James and John Dewey started to explore the limitations of logical form—inductive and deductive reasoning. Their interest was centered on the processes by which people come to know and understand rather than the search for correct and incorrect answers.⁵² They did not perceive gaining knowledge as abstract or conceptual; instead, their approach involved interaction and inquiry when engaging with their surroundings. Understanding was not about aiming for or arriving at an absolute truth but about interacting with a context. One of their supporters was Charles Sanders Peirce, who proclaimed that no new ideas could be proved using the traditional methods of deduction or induction when dealing with old data.

Martin Scheerer directed his attention to a phenomenon known as fixation in problem solving. He describes how people latch on to false notions or assumptions regarding a problem that needs solving.⁵³ Scheerer argued that fixation can be overcome by an abrupt shift in perspective, but he did not offer a solution as to how it is overcome. A possible solution can be found in Peirce's method of thinking—a new way of looking at the task at hand. According to Peirce, new ideas come into being through “logical leaps of the mind.”⁵⁴ The thinker, or designer in this case, would understand the subject matter through an “inference to the best explanation.”⁵⁵ More specifically, ideas surfaced when a thinker looked at data in a novel way that did not follow a pattern of preexisting models. This process became known as “abductive logic.”⁵⁶

Jon Kolko perceives the way designers solve problems conceptually through the context of a particular “frame.”⁵⁷ Donald Schön explains that a design “hypothesis depends on a normative framing of the situation, a setting of some problems to be solved.”⁵⁸ Normative framing is a perspective that highlights some characteristics and relationships to simplify a complicated situation.⁵⁹ The frame is usually chosen without reflection or analysis but based on assumptions, research, and experiences—there is no formula. Framing can be a helpful technique to “organize the large-scale structure of inference making.”⁶⁰ Or as Kenneth Fitzgerald professes, “There is no dominating formality or ideology to produce design.”⁶¹ An abundance of theories and practices exist to determine the direction of any design outcome.

Conclusion

The definition of design is more evident in the activity of designing than it is in the resulting by-products. The characteristics once used to describe design have shifted and will continue to do so. Therefore, designers must reconsider the problem-solving model not only for the sake of a clearer and more specialized definition but to truly encapsulate what it means to design. It is important to acknowledge

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- 52 John Dewey, *Essays in Experimental Logic* (New York: Dover, 1958).
- 53 Martin Scheerer, “Problem Solving,” *Scientific American* 208 (1963): 118–28.
- 54 Roger Martin, “Design Thinking,” in *The Design of Business: Why Design Thinking Is the Next Competitive Advantage* (Boston: Harvard Business Press, 2009), 64.
- 55 Martin, “Design Thinking,” 64.
- 56 Andrew Howat, “Peirce on Grounding the Laws of Logic,” *Transactions of the Charles S. Peirce Society* 50, no. 4 (2014): 480–500.
- 57 Jon Kolko, “Abductive Thinking and Sensemaking: The Drivers of Design Synthesis,” *Design Issues* 26, no. 1 (Winter 2010): 22.
- 58 Donald A. Schön, “Problems, Frames and Perspectives on Designing,” *Design Studies* 5 (1984): 132–36.
- 59 Hideaki Takeda, Akira Tsumaya, and Tetsuo Tomiyama, “Synthesis Thought Processes in Design,” in *Integration of Process Knowledge into Design Support Systems* (Dordrecht: Springer, 1999), 249–58, https://doi.org/10.1007/978-94-017-1901-8_22.
- 60 Gary Klein, Brian Moon, and Robert R. Hoffman, “Making Sense of Sense-making 1: Alternative Perspectives,” *IEEE Intelligent Systems* 21, no. 4 (July 2006): 71.
- 61 Kenneth Fitzgerald, “Quietude,” *Emigre* no. 64 (2003): 34.

that problems exist all over the world, however, contexts that hint at the existence of ideal answers are counterintuitive to design processes and their outcomes. As designers, the approach of designing only for the “problem” at hand is a paradigm of delivering solutions rather than solving problems. Such a model fails to recognize the influence of what is being designed and its effects beyond the context of the design brief.

Ultimately, one may ask if design is not being approached as problem solving, what is its function or role? There is no concrete answer, but a possible approach is to adopt an inquiry-based mindset. While inquiry is not specific to the field, it is exploratory—as is design. Unlike empirical research, which often begins with a thesis statement, followed by data collection, analysis, and conclusions, inquiry is flexible and can be thought of as an antimethodological methodology that poses questions without preconceptions of where they will lead. This approach entails dabbling in the realms of possibility while creating space to discuss and debate what design is and factors that are shaping the cultures around us.

Over time, the observable lack of exploration, experimentation, and design evaluation in my students’ making processes has been a result of the problem-solving model they have embraced as the most acceptable way to design. The purpose of this article is not to stress the semantics of carefully selected terms that demonstrate a command of design. It is meant as a starting point for future research in exploring language through practice to inform design processes for students and practitioners. The rise of interdisciplinary design is a contributing factor to the continuous shift in what it means to be a designer in today’s world.⁶² To this end, exposure to varied outcomes of design through seminars, field and studio visits, and transforming student projects into co-design experiences has encouraged many of my students to adopt a more open-ended and evaluative design mindset. Such explorations are only a beginning in trying to frame design differently in hopes of directing its activities toward flexibility of outcomes. There will not be a fail-safe method to follow in the different design practices. What would be potentially more productive is to evaluate what emerges from design processes: are they good design outcomes—formally, meaningfully, and socially? What additional evaluative steps can be taken to explore more effective outputs? The designer can then make an informed decision and choose the best possible outcome in any given context.

In this light, an alternative definition I put forth for design is “a facilitator of human needs, experiences, and desires.” Design can facilitate interactions between people, places, and things, such as immersive experiences in museums. It can create habitable living spaces such as those created by architectural and interior designers,

62 Richard E. West, “Breaking Down Walls to Creativity through Interdisciplinary Design,” *Educational Technology* 56, no. 6 (2016): 47–52, <http://www.jstor.org/stable/44430508>.

and it can improve day-to-day functional objects, such as innovative seating with ergonomics. These are only a few simple examples that identify design as flexible, useful, evolutionary, and at times universal in its applications. The connection between design outcomes and whom we are designing for is the most noteworthy facilitation of all. By reframing our approaches to design, we are not only moving away from the fixation on glorifying design as a practice that is solution-based, but we are also considering what will—in some respects—improve the lives of clients, users, audiences, and stakeholders.

Redefining what it means to design is a step back from the lofty notion that design can solve problems, but many steps toward designers gaining self-awareness in the mediation between what is created, how it is received, and the decisions made to evaluate and build on outputs. What is needed in educational institutions and in design professional practices is to frame design as an activity of facilitation, not just creation. From theoretical and practical standpoints, facilitation is an important part of every designer's role.

Instead of thinking about design as problem solving, we can begin to see it as responsive. What we design involves us, whom we work with, and the people who will eventually engage with what we make. By not approaching all design outcomes as correct answers, designers give others the space to respond and become part of the dialogue in the spirit of an ongoing process. By channeling an awareness of what they aim to make, designers can set reasonable and open-ended expectations as every design process progresses.

Viewing design through the lens of responses rather than solutions liberates the design process from right and wrong answers. Instead, it encourages finding a balance between the information that is collected, synthesis, form generation, and evaluation. Looking forward, it is essential to continuously explore the meaning of design and the roles designers play. The main implication of this article is to continuously revisit the meaning of design now and in the future, not only as a means to reframe design-related language and approaches but fundamentally to facilitate design approaches that encourage flexible thinking and making.