

To Design Is to Understand Uncertainty

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This is the second article in an ongoing series by Dr. James Self in which he explores designers' approaches and tools in support of a thoughtful, reflective design activity.

CAD vs. Sketching, Why Ask? · To Design Is to Understand Uncertainty · TDRs & Conceptual Design Practices

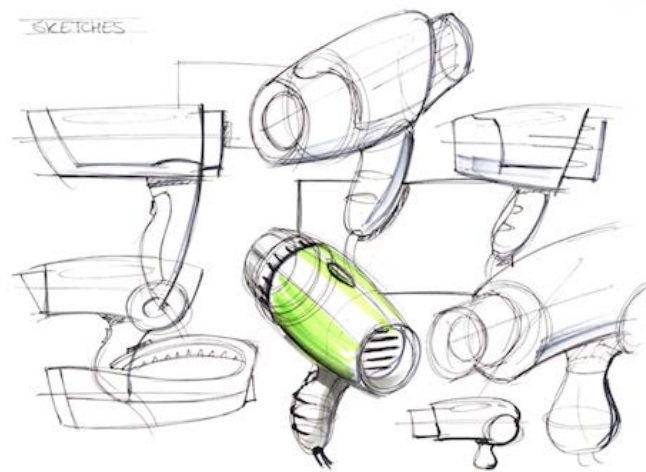


Figure 1 Image courtesy of [Michel Boot]

Design practitioners are well-aware of and indeed exploit uncertainty as a means to facilitate design thinking, innovation and creativity. As design intentions are explored through the use of designerly tools such as sketching, design activity remains divergent, iterative and uncommitted. This ambiguous uncertainty facilitates design thinking and the exploration of often ill-defined design problems. In short, there exists a unique relationship between uncertainty and design activity. Because to design is to engage with an exploration of ideas towards the yet to be. Understanding this relationship is important if we are to develop our understanding of what it is to design.

So, what is uncertainty and what contribution can it make to design activity and design thinking?

In order to understand uncertainty as it relates to design activity it is important to first attempt to define it. The Oxford English dictionary offers the following definition:

The state of being uncertain... not able to be relied on; not known or definite.

This suggests uncertainty is a human state or emotion, a reaction to situations that are or appear to be unknown or unclear; the ambiguous. This definition of uncertainty has implied negative connotations—the natural response to uncertainty is to employ a course of action with the purpose of resolving the uncertain state; to seek the truth. In the natural sciences, where the objective is to understand the world as it is, this makes good sense. Through scientific enquiry we discover truths about our natural world. We are able to develop an understanding of how the world is.

But what if our purpose is to develop strategies, ideas and thinking towards that which does not yet exist? How should uncertainty be approached and what can this then tell us about the unique nature of designerly ways of knowing? Before addressing these questions it is worth spending a few moments to consider the slippery subject of what it is to design.

It has been well documented in previous attempts to define 'design' that the word immediately throws up challenges in coming to a consensus of its use and meaning. Ironically, the meaning of design remains uncertain! This is not the time or the place to engage in a discussion of the various semantic meanings of the word. However, for the purposes of our discussion of uncertainty in design activity, we will refer to the word design as a verb; as in *to design*—we are referring to the activity of designing. We can also say that the act of designing has, at its core, a requirement to adapt an existing system, process or object in a new way or to describe a new system, process or object. The designer is a futurist—they must explore, develop and present concepts and ideas towards that which may be, but does not yet exist.

So engagement in an activity of design is characterised by the exploration of the yet to be. As a result of this, design activity involves engagement with not only the unknown, as in the pursuit of knowledge in the sciences, but that which cannot be known because it does not yet exist. It is because design activity involves an exploration of the yet to be that design is unique in its relationship with uncertainty.

Related to this uniqueness, design problems may be described as ill-defined or wicked, where the solution to the problem or outcome is unknown or unclear at the start of the process.

There may be more than one 'correct' solution to any given design problem. The designer's role is to explore alternatives, finally coming to the specification of a best or optimal solution. A primary concern of design activity is to explore the ill-defined design problem through the generation of solution ideas or conjectures (for more on this see Nigel Cross's influential book: *Designerly Ways of Knowing*). These solution conjectures may take the form of sketches, illustrations and drawings, models and prototypes of various kinds and levels of fidelity. It is through the process and activity of using what I am calling here designerly tools (the process of sketching, of constructing a digital model for example) that the problem is defined and thinking towards solution ideas develops.

Now, of course, the nature or character of the tool-in-hand will have implications for the kinds of design embodiments made and so the role of uncertainty in an activity of design. For example, the representation of design ideas through hand-sketching may afford a particular kind of design embodiment, a more divergent exploration of design ideas which communicate intent as less committed supporting an engagement with uncertainty. In contrast, the use of digital modelling tools such as Solidworks may influence the character of the design embodiment, the nature of design activity and the role uncertainty plays within it. This is because of the command-based nature of the tool and the resulting affordances and limitations to the embodiment and communication of design intent as 3D digital models.

There exists a healthy discourse related to the affordances and limitations of various designerly tools, both here at Core77 and within academic and professional journals. What seems absent in much of what is written about design activity, however, is the influence of the tool user. That is, the designer's own idiosyncratic approach to design activity, the use of designerly tools and the implications this has for the nature of the activity and the kinds of tools employed to support it. Within this the designer's own levels of experience seems significant for the ways in which designerly tools are chosen and employed and the role uncertainty plays in the act of designing.

An important influence on the designer's approach to design activity and tool use is their experience of practice. This, of course, seems intuitive in that one's experience of an activity will define the way the activity is performed as knowledge and skills are honed and developed. What we are particularly interested in here is the ways in which design experience

influences the practitioner's approach to and engagement with uncertainty during an act of designing.

In a previous post here at Core77, I spoke about the ways students of design tended towards those tools that may facilitate and support a more convergent design activity. Since the publication of the article I've got on to thinking about the student's engagement with uncertainty. From my research and own observations, I've started to develop the position that design students are less inclined to engage in situations of uncertainty when using design tools compared to more experienced practitioners. Students take an approach that is more suited to activities where the purpose and objective of the activity is known. This is unsurprising as it is the engagement with known problems that dominates the student's education; finding and using the facts or the known truths to answer the question. Students have had few opportunities to engage and use uncertainty as an approach to dealing with the ill-defined problems that characterise design activity.

As the inexperienced design student encounters uncertainty in the act of designing, they feel lost and disorientated. They wish, somewhat intuitively, to define a solution quickly. They may tend to rush hastily down a single track, not knowing or being aware that they are moving towards a situation where they 'know what they're doing' at the expense of the insight and innovation engagement with uncertainty can bring.

It is in these situations that the seductive certainty of those designerly tools that support design definition and convergence can be most restricting.

In contrast, the well-heeled design practitioner understands the use of uncertainty and ambiguity as it relates to design practice. Uncertainty is used to explore possibility and, through this exploration, provides opportunities for discussion, iteration and design thinking. Indeed, uncertainty becomes an important element of the activity, promoting a discourse around the development of design ideas, both with other stakeholders and the designer's own self in the exploration of one's own design thinking.

Uncertainty has a unique place in the activity of design. The designer's ability to deploy it has implications for the activity and outcome. For this reason, students of design need to be introduced to the principle of uncertainty and the unique ways it is employed by the designer in the pursuit of the yet to be. They will then be better placed to take a more informed and holistic approach to the use of the various design tools available to the contemporary designer. Less experienced designers need then to be provided with opportunities to consider their own

reaction to and engagement with uncertainty and the implications this has for their use of designerly tools, design activity and design thinking. Understanding the unique ways in which uncertainty is engaged and employed during an activity of design will bring us closer to defining what it is to be an expert in designerly ways of acting and knowing.