

**Rotman School of Management, University of Toronto**

**Interview – Nigel Cross**

Interview by Stephen Watt

**Design has been described as a missing ‘third area’ of education, one that is just in its infancy compared to education in the sciences or in the arts or humanities. Why is it important to understand the particular way that designers approach and solve problems?**

The way designers approach and solve problems is an overlooked field. ‘Designerly’ ways of thinking have been fairly neglected by general education, both at the elementary school level and in higher education, at least in any kind of non-specialized, non-professional training. That’s probably because most of those who work in education themselves come from the sciences or the humanities. They don’t come from a design background.

If you’re teaching in general education, you need to understand the intrinsic values of the subject area you’re teaching: what’s valuable about the skills that are involved and what is going to be relevant to everyone, not just the specialists. Look at the teaching of science, for example. Everybody receives some science education, but they aren’t all going to be scientists. We believe that there’s something valuable about scientific ways of understanding and thinking, which is why the subject is widely taught.

We need to take the same approach to design education. Design thinking is not only important for things like business, industry and the economy, but also for society at large and everyone’s quality of life. We live in a designed world. Everything around us has been designed in some way. Both for the sake of living in this world, and for the sake of improving the performance and outcome of design, we need to do a better job of understanding how design works, and how design thinking works.

Also, of course, there’s just the intellectual challenge, of seeking to understand an aspect of human behavior – the ability to design – that’s really a very high level ability. I regard design thinking as one of the several forms in which human intelligence operates, and so it seems natural to want to understand that intelligence, to understand ourselves.

**Describe how the ‘constructive’ or ‘concrete’ thinking involved in design differs from the types of reasoning offered by the sciences and the humanities.**

The psychologists and educationists who have gone about classifying different types of reasoning have tended to define constructive or concrete thinking as a sort of lower level of reasoning than abstract or symbolic thinking. This is a mistake. Design thinking is about making constructive responses to practical problems, issues and situations. This type of thinking means being practical, and involves creating solutions and resolving problem areas. Constructive thinking is also about being imaginative, and imagining how something *might* be, not just how it *is*. This is what makes design thinking quite a high level and difficult form of reasoning: it must move from abstract requirements to concrete proposals.

**Design ability is often thought to be a mysterious ‘gift’. Is there an optimal design process that can be learned?**

Much of my work in the design area has been aimed at removing the myth that there is a gift, a creative spark involved in design, that only certain isolated geniuses possess. I think instead that design ability is

contained in everyone to different degrees, although some people are undoubtedly better at it than other people. So some of my work has been concerned with studying how these high achievers in design go about their work, as well as looking at novice and student designers to see how we might help them to improve.

But I don't think that there is a single optimal process that can be learned. I favor instead taking a broad, strategic approach, operating within an overall strategy that's adapted to the project in hand. There are tools and techniques that can be learned, but how you put them together is likely unique to that project. A different overall strategy is required depending on the situation and the team of people you're working with.

That said, there are some recurring features of the design process across different designers and different design domains. A common process visible in the work of highly successful designers might include things like adopting a broad 'systems view' of the situation, and taking a much wider view of the problem than what has been given. This is the sort of broad approach that myself and my colleagues usually advocate.

### **What does design thinking have to teach business?**

I have two slogans that I tend to use nowadays. One is 'design without compromise', and the other is 'imagination with responsibility'. It's often said that design is about coming to a compromise: you have to strike a balance between speed and cost, for example. However, I think that when you see good design, you don't see compromise. Good designers start with the goal of resolving the conflicts and arriving at a neat solution. The first thing I'd say to business managers is if they're approaching anything in a 'designerly' way is to not start with compromise in mind.

'Imagination with responsibility' points to the fact that successful design is not necessarily about creating a product for profit. This is a difference in how business people often approach design versus the process favoured by designers themselves. A responsible approach is needed to introduce new products or systems to society and the environment. We have to be much more careful than perhaps we were in the past about factors other than just pure profit.

### **Is it possible for managers with no design experience to learn to use the tools of creative cognition?**

Yes they can. My design teaching is about reaching a wide range of students and showing them different tools, whether those tools be creative, or more rational and systematic in nature. Like any tools, they require practice, perhaps some prior apprenticeship in learning how to use them, perhaps some skill development through practice, and yes, a measure of personal aptitude. Some people are not as comfortable with the tools and techniques of creativity as others, so some influence of aptitude and personality may come into play.

### **How can design thinking help managers tackle 'wicked' problems?**

Part of the difficulty in dealing with wicked problems is you don't know when you've got the right solution. There's no definitive, correct solution, and there's no definitive, correct view of the problem. They're called wicked problems because they haven't been tamed; they haven't been structured or well-defined; they're not cut and dried; and they don't yield readily to a single optimal solution. This is an important point because much of training in management and reasoning is about finding the 'right' solution. In dealing with wicked problems, it's not about optimizing, it's about 'satisficing', as Herbert Simon describes it in his book *The Sciences of the Artificial*. Simon, himself greatly accomplished in science and economics, realized that when faced with these sorts of intractable problems, you can't actually optimize a solution, but rather find one that is satisfactory.

Another thing we've realized about these wicked problems is that the problem and the solution have to be – and indeed do – develop together. The understanding of the problem begins to develop as soon as you

try to develop ideas as to how you're going to solve it. It's a mistake to set out what the problem is first and then try to find a solution. Be prepared for the fact that the problem and the solution will co-evolve, and you're going to go to and fro between the two of them.

The final point about wicked problems is that constructive or design thinking is indeed the best way to tackle them.

**Successful designers often quickly arrive at ideas for a solution before fully exploring the nature of the problem to be resolved. Why may it be a better idea to focus on the solution rather than the problem?**

In an interview, Tom Stoppard, the British playwright, was asked about his own creative process. He replied, "You can't start until you know what you're doing, and you don't know what you're doing until you start." This is the conundrum which applies in all creative endeavour, whether it be in the arts, sciences or design: the stages of starting a project and understanding a project occur simultaneously. Problem exploration is important, and you shouldn't be designing from total ignorance, but it's always possible to go on with the exploration of the challenge for too long, and put off the more important question of how you're going to discover an elegant solution. You must be prepared to generate tentative solutions as you're working on understanding the problem, because those tentative solutions will sharpen your awareness of the problem, and frame it in a new light.

There's this idea that successful creativity involves taking a crazy leap into a world of imagination, which I think is misleading. Most good solutions are not produced by taking a leap; they result from a process of building bridges between the problem area and the solution area. They start out as tentative solution-ideas that structure a problem and enable progress to be made, rather than working forever in the problem area.

**What other tools of the design discipline may be helpful for managers to learn?**

One aspect of constructive thinking that might apply well to a business context is what I call 'constructive discontent'. Designers usually start their creative process with a feeling of discontent with the way things are. Many people feel such discontent, but designers will draw upon that reaction and try to make something constructive out of it, to focus on the object of discontent and make it better, rather than just criticizing it. This is a healthy habit that might also be cultivated by successful managers.

I suspect that there are many parallels between successful designers and successful managers. For example, being able to live with a lot of uncertainty and ambiguity, and being able to move rapidly and freely between different levels of detail – keeping a whole view in mind, as well as dealing with the details. And, of course, living with creativity, with creative people and processes.

In general, there's been an increasing awareness of the value of the creative tools and habits employed by designers, and the value of these tools to the business world. As this dialogue continues to develop and new commonalities are discovered, the results are going to be unexpected, exciting and fruitful.

Nigel Cross is a Professor of Design Studies in the Department of Design and Innovation at the Open University, UK, where he has been involved in a wide range of distance-education courses in design and technology. Cross has conducted research in design since the nineteen-sixties, ranging across computer-aided design, design methodology, design epistemology and design cognition. He is author of *Designerly Ways of Knowing* (Springer, 2006; Birkhauser paperback, 2007) and *Engineering Design Methods: Strategies for Product Design* (Wiley, 2008). He co-edited *Analysing Design Activity* with Christiaans and Dorst (Wiley, 1996), and he is Editor-in-Chief of the journal *Design Studies*.