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Creativity as Invention, Discovery, Innovation and Intuition: an Interview with Dr. Richard Buchanan

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Can you teach creativity? My belief is yes, you can. — Richard Buchanan

When you ask creative people how they did something, they feel a little guilty because they didn't really do it. They just saw something. — Steve Jobs

Introduction

In this ongoing series of interviews, we aim to capture the richness and diversity of the creative process through discussion with creativity scholars and researchers. As a way of being in the world, creativity touches on a number of disciplines and contexts. This is why our interviews have attempted to understand creativity and the creative process through a range of lenses and contexts, including psychology, neuroscience, teamwork, improvisation, organizational creativity, design thinking, writing and more.

One approach to creativity that has recently received attention falls under the broad label of design thinking, or designerly ways of knowing. This approach has been described as a process to promote the development of creative solutions to complex and often intractable problems. An earlier article in this series featured an interview with design theorist and practitioner Dr. Paul Pangaro. In this article we feature another renowned design theorist and scholar, Dr. Richard Buchanan.

Dr. Buchanan serves as Professor of Design & Innovation in the *Weatherhead School of Management* at *Case Western University*, as well as being Chair Professor of Design Theory, Practice, and Entrepreneurship, in the *College of Design & Innovation* at *Tongji University*. He is known for extending the application of design into new areas of theory and practice, writing, and teaching, as well as practicing the concepts and methods of interaction design. Dr. Buchanan's work is predicated on the belief that design extends into the personal and social life of human beings, as well as into organizational and management design. Along these lines, he has served as expert consultant on projects as varied as the redesign of the Australian Taxation System, or the restructuring of service products and information for the U.S. Postal Service, among others. His books include, *Discovering Design: Explorations in Design Studies*, *The Idea of Design*, and *Pluralism in Theory and Practice* (Garver and Buchanan 2000; Buchanan and Margolin 1995; Margolin and Buchanan 1995). He also serves as Editor of *Design Issues*, an international journal of design history, theory and criticism and has been president of the *Design Research Society*.

Design is a highly interdisciplinary field, and Dr. Buchanan's grounding in this area can be traced back to his educational background. He received his PhD from a prestigious interdisciplinary program at the *University of Chicago* called the *Committee on the Analysis of Ideas and the Study of Methods*. He described how his background influenced his wide-ranging interests, which all intersected around design, saying of the program:

We crossed disciplinary boundaries easily, and I became quite comfortable with the humanistic study of a wide range of kinds of knowledge. As I began to work on my

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dissertation, I discovered design and it sat there as a question mark in my mind. What is this ability to create the artificial, that people use and live with every day? My own dissertation was on the qualities of rhythm in experience, and I looked at a variety of kinds of works. That was the beginning of my concern for human experience, and the move into design came naturally enough.

Stemming from this multi-dimensional background, Dr. Buchanan provides a unique perspective on creativity through the lens of design. This conversation with Dr. Buchanan highlighted several key themes that frame his perspective on creativity and design. We cover just a few of these areas here, including: *grounding creativity in classical philosophy*; *creativity as perceiving,* and *creativity, education, and technology*. We take each in turn—beginning with his discussion of the roots of creativity in classical philosophy.

The Philosophical Roots of Creativity

In defining creativity, Dr. Buchanan draws upon his philosophical background and looks to concepts from classical philosophy stretching back to antiquity. Creativity is an immensely ambiguous term, which he says has "so many different definitions and meanings to people that it can be troubling to even talk about the subject." This diffusion of definitions has often been a challenge for the field of creativity research. While researchers often agree that creative works have some elements of novelty and effectiveness (Oldham and Cummings 1996)—from there, the meanings become diffuse and scatter in many directions around product, process, personality traits, psychological makeup, and more (Glück et al. 2002). Dr. Buchanan reminded us that despite the fascination with the topic of creativity in contemporary culture, we can also draw on source material with deeper roots:

If you trace it back through Western culture, you go back to the Romans and the Greeks, and the beginnings of the discussions of creativity. I think we often neglect the importance of the early work on invention theory, which is one of the great sources of our discussions of creativity. Most people don't even know about that. But that's the origin.

Invention theory (Inventio), is one of the canons of rhetoric in Greek-Roman philosophy, and is used for the *discovery of arguments* in Western rhetoric. It derives from the Latin word meaning "invention" or "discovery," and refers to a systematic search for

arguments. A speaker would use Inventio as the central canon of rhetoric to begin the thought process of forming and developing an effective argument. As relates to the ability to create ideas, the invention phase was seen as a first step in an effort to generate ideas or create a convincing and compelling argument. Simonson (2014) suggests that these traditional roots of creativity have influenced contemporary views. Yet this traditional view has also shifted based on modernizing impulses, such as the focus on how people make connections between different disciplines, ideas, or contexts, to come up with something novel and effective.

Dr. Buchanan suggests that modern psychological views on creativity sometimes miss something critical that comes from the humanistic arts. He draws upon some of the techniques or ideas associated with classical invention theory to tap into creativity, noting:

For the Romans, for instance in Cicero, the study of what are called topics or places, *topoi*, are the source of creativity. They can be traced back to Aristotle and Plato as well. The opposition is between a topic and a category…Categories help us to fix the meanings of things. If I say, "chair," you think of a categorical term "chair," and you can look up the definition. But if I take chair and say, "Can I break that category? Can I change that categorical meaning? Can I make it something other than we understand? Something that's not familiar now but that could become?" That's where creativity and invention play. A topic is the key tool, intellectually, for melting down the categories around us. That's what designers do. They melt the categories where we think we know what is, and they show us what could be.

Thus, topics or *topoi* are basic categories of relationships among ideas, which may offer a template or heuristic for coming up with things to say (or think) about a subject. "Topics of invention" essentially translates to "places to find things." In this sense, topics or topoi (from the classical Latin) provide us with a way of using language to rethink or re-see what we think we know. In our human psychology, what we know and think—our associations about the world around us—are structured into categories which allow us to understand things in relation to other things. However, this basis for comparison or differentiation can also become a barrier to making novel associations or breaking down the familiar.

Buchanan uses topics or topoi as a way of helping designers rethink what they know, questioning assumptions, or making the familiar unfamiliar. This is akin to the idea of "making the familiar strange" which scholars have sometimes noted as key to creative thinking (Davis

1999). Here, designers have an intellectual tool for this, as Dr. Buchanan describes:

> Creativity moves us from the known to the unknown, and the tool in that process is a topic. So my great concern, is not creativity alone…I see a cluster of terms, I see "invention," "discovery," "innovation," and "intuition." Those four terms are, to me, the dimensions of what we call "creativity."

Dr. Buchanan's view of creativity includes but also goes beyond the standard definition. In one sense, his view points to a transdisciplinary understanding of creativity—as the ability to connect across the lines of different arenas, or as he put it, "how we connect arguments across disciplines, how we connect stories, stories in one area to something we're doing now. And that sudden perception of a connection, that is what we often mean by 'innovation,' or creativity." But while this is important, he goes on to say:

> I teach my students something else, too. I teach them about invention, about how to use topics. All of this is concerned with how we perceive, and what we perceive. Creativity is nothing more, and nothing less, than a perception of what is not familiar, what we don't know, what we don't have in front of us. Really, to perceive is the key, so I teach my students how to perceive in new ways.

Creativity as Perceiving

This view of creativity as a kind of perception is how Dr. Buchanan views the arena of creative work. He teaches his students about the difference between invention and discovery, in that discovery is about taking an invention and applying it to experience, which lets you discover facts about the world. When you in turn take the discovery and try to do something with it, you push that invention through discovery into action. Thus we begin to look at the connections of the stories and arguments that we tell, through the ability to cross over and to perceive a connection between seemingly different things.

Dr. Buchanan offered the example of Henry Ford's insights here. He notes how Ford's inspiration for the invention of the assembly line originated from seeing the carcasses of pigs in a Chicago meat plant moving down a line as the carvers cut off the slices of meat. This reveals an ability to see a connection from two different stories that seemed to be totally unconnected. From this insight, Ford began with the assembly of parts of motors and gradually moved to the entire assembly line. That little bit of a flicker, a flash of insight, was a perception of some possibility. This denotes innovation in the way that we usually describe creativity as a way of seeing connections—hence, innovation involves perceiving.

The connection between Dr. Buchanan's description on topoi and categories can help shed a theoretical light on this example. For instance, if Henry Ford would have stuck with seeing the activity in the meat plant as being just within the category of "meat factory" he would not have perceived its application to car manufacturing. It was his identifying a theme (or topoi) that allowed him to play across categories and see connections that others had not seen before.

But there is something else in that story of Ford, argues Buchanan, that was critical and which people do not always perceive, and that is the role of intuition. At some point, Ford decided to double the salary of his workers, and people at the time thought this was counterintuitive. Dr. Buchanan noted that this was actually great intuition on Ford's part, because he intuited and understood what the system was. By doubling the salaries, he created consumers and people who could buy the cars. As Buchanan states:

> That intuition goes beyond innovation; it's the perception of a connection that leads you to grasp an entire system, or the wholeness of a system. I think he had a great intuition, and he acted on it. Everyone at the time thought, "Oh, this is terrible. This will be disastrous." But his intuition was correct. He understood the system, perceived and acted on it. So those are the terms I use—I use invention, discovery, and innovation, which is a code word for creativity today, and then intuition. I am distressed when I read some of the work in cognitive psychology that diminishes the significance of intuition.

Dr. Buchanan describes how scholars often describe "expert intuition" as relying on accumulated knowledge stored in memory, which can then be accessed, used, or reconfigured as needed to fit the given situation or solve a problem. However, he points out that expert intuition is useful only in situations that are consistent with what has gone before. But clearly there are limits to this. It is not the regularity of what we see around us that is crucial to creativity. As Buchanan states, "It's the perception of the possibility of something that goes beyond that regularity. And so I would say that creativity benefits by immersion in experience, but it is not bound entirely by memory."

In this, Dr. Buchanan separates himself from scholars such as Herbert Simon who believed creativity was a matter of deep exploration of the brain's ability to hold past experiences, and then reconfigure what already exists in memory (Simon 1969). But Dr. Buchanan comments:

> I think that is a mistake…I see intuition as a very significant matter in creativity. In reading Spinoza, for instance, in his *Ethics*, he says that the sequence is imagination and reason, but beyond imagination

and reason it is intuition that gives us the greatest knowledge. Now what could he possibly mean by that, except the ability to perceive some deeper connection, some deeper system that goes beyond our arguments and our rational structures? To grasp a wholeness. And I think this is what designers do. I think they grasp the wholeness of a product.

This view of design, and creativity, as an act of perception or way of grasping wholeness, explains how designers and creators make or discover things, such as products, artifacts, ideas, and more. So grasping the wholeness of a system is a way of learning to see, which connects to the ability to intuit. Buchanan suggests that, "Every product is a system, whether it's tangible, intangible, information, actional. But the ability to grasp the wholeness takes us beyond the bits and pieces, takes us beyond the tricks of skill that are such an obsessive concern in design education today." He expressed concern that increasingly these skills are becoming degraded by consulting firms that try to sell design as a batch of tricks. Going beyond such a batch of tricks is what great designers do. This is part of the essence of creativity—as an intuition of how it all fits together.

When we look at a word like intuition, it seems to imply something ephemeral or inherent, something intrinsic or internal, in short, something that could not be taught. However, Dr. Buchanan is definitely clear about his belief that creativity is teachable—and here, there are implications for education.

Creativity, Education, and Technology

There are numerous phrases that encircle the debate about whether creativity can be taught to students and if so, how, such as: *teaching creativity*, *teaching for creativity*, *teaching creatively*, *developing creativity*, and so on. Much educational scholarship has been framed with an assumption that we may not be able to directly teach creativity, but that we can design learning that promotes creativity—through more open-ended learning experiences, challenging project-based work, opportunities to engage creative processes, and so on. In fact, in one of our previous interviews with educational creativity scholar Dr. Keith Sawyer (Henriksen et al. 2017), Sawyer stated "Whatever creativity is, I don't think you can teach it. You can design experiences, and by engaging in those experiences a learner might learn to become creative."

Dr. Buchanan brings in a slightly different perspective here in which he clearly asserts that *creativity is teachable*, saying:

Can you teach creativity? My belief is yes, you can. Certainly. To 95 percent of the population you can teach

it. And I get tired of the idea that creativity is something esoteric and elite. It's not. When you help people to perceive new possibilities for their own lives, how they lead their lives, that's a major development.

The teachability of creativity is a way of teaching people how to perceive, how to ask questions and make connections. This returns us to the idea of topics or topoi, which Buchanan directly teaches and practices with his design students, to expand their thinking and help them perceive and see connections and possibilities—as he puts it, to melt the categories around us.

Dr. Buchanan notes that we can compare this approach to education in the arts, in which there are several ways that people become fluent. One possibility is that some few rare people merely have "natural genius, and they just do what they do." Another way is in the idea that the arts (like creativity) can be taught through apprenticeship with someone who is very good and skillful in some area of design, in creativity. Another method, which he speaks to as direct instruction in creativity, refers to how we teach the principles. He notes that this is what universities do. They teach the principles behind certain professional or knowledge activities. And we can teach the principles of creativity to students, and teach this through experiential work. Dr. Buchanan is a strong follower of John Dewey's (1916, 1934) notions of creative education, and this applies to his work in design for teaching people to be creative through experience and inquiry:

I call design thinking "creative inquiry." It is a form of creative action, and I work with students to help mold their experiences of perceiving new things and make them comfortable with that, and show them some of the principles that guide coming up with new ideas. Design thinking is a discipline…It means asking and answering good questions about every situation we run into. I travel a great deal, all over the world, and when I travel, I often walk with designers through their cities. And when you walk with a designer through a great city, listening to what the designer says and seeing what they see is a revelation, it's just an amazing experience. Their ability to ask questions of the environment, to interrogate the environment, and to find the answers shows this great perceptive capability.

This, for him, makes design thinking a creative discipline of asking and answering good questions about every situation. The creative inquiry of design thinking might be applied to education in many forms and contexts, across grade levels and subject matters. While the

questions vary based on context, the premise of learning how to ask good questions and seek answers is part of creative practice that any teacher or student can access. As Buchanan says:

> Wherever I go I ask questions all the time. I ask questions, and I think about what might be the answers, and I listen to what people say are the answers. That, to me, is the essence of design itself, that design thinking is no different than design itself.

The Deweyan notion of learning by experience or inquiry and engagement with the arts and humanities runs deep in Dr. Buchanan's views. He notes that design education pioneered the notion of teaching by projects, and Dewey's concern for doing and making as part of education is very much at the center of that. Thus, the artistic, experiential and inquiry-based nature of design work makes it intimately connected to higher order thinking, and suggests that we can educate for creativity.

These ideas around education and the arts also flow into Dr. Buchanan's views about technology. He points out that contemporary discussions of technology often view it in a concrete or hardware-centered manner. In this, we have gotten away from the very roots and meaning of technology. He points out that the liberal arts are themselves technologies and they come from the roots of the words *Techne* and *Logos*. *Techne* means art, skill, craft, or the way, manner, or means by which a thing is gained. *Logos* means reason or word, the utterance by which inward thought is expressed, a saying, or an expression. He suggests of the liberal arts:

> They are technologies of how we think and express, and I think there's been a tendency to reduce the meaning of "technology" to hardware and software and without a recognition that it's the technologies of how we think that make the others possible. We get so caught up in the details of software and so forth.

Dr. Buchanan points out that even for Steve Jobs, intuition was more important than reason. He noted that Jobs saw the success of Apple and its technology ventures in the ability to combine technology with the liberal arts, stating that, "The sense of the humanities, in how we think and how we act and how we communicate are the foundation of Apple's great success. Whether it continues to be, who knows? Who knows about that? But I think at the heart of the computer revolution comes these kinds of issues."

Dr. Buchanan did not express his views on technology as an optimist, pessimist, advocate or naysayer, and he does believe that technology is a possible site for creativity. He simply expresses concern that we as a society bring in an awareness, knowledge, and humanity to the terrain, noting:

> I don't think it [technology] gets in the way of creativity. It's certainly another place for creativity…It's a great place to play. But we have to remember that design is significant because of its concern for human beings. Without that principled concern for the dignity of human beings, it's worthless.

This again calls back Dr. Buchanan's deep grounding in the humanities, and how this foundation plays into all that he does as an educator and a designer. He expressed how the human and ethical side of creativity is paramount, and noted that in the world of design—be it design in education, technology, or any other discipline—human beings are central, and a sense of ethics are essential to the fabric of good, human-centered design. This moors the idea of creativity and grounds it within a broader humanistic perspective.

Conclusion

Our interviews with creativity researchers aim to provide a close look at the ideas and work of individual scholars with particular expertise, such as in this conversation with Dr. Richard Buchanan. And across these spaces we aim to offer a glimpse of the scope and range of the field.

Creativity began to emerge most strongly as a field of scholarly inquiry in the latter half of the twentieth century, and in recent years it has moved even more heavily into popular discourse. In research and academia, it has often been predominantly located in psychology (Runco 2014). These psychological views (or corruptions of such views) have often crept into popular culture, leading to beliefs that creativity is only for gifted people, or is an ability that is either present, or not, in individuals. Dr. Buchanan's views are an important counterpoint—not only in bringing a unique design perspective into play, but also in pointing out what the psychology perspective misses. His philosophical grounding brings in new ways of thinking about how rhetoric can shape how we think creatively, and the tools with which we can support this. While Dr. Buchanan points to the value of experience, immersion, and knowledge for making transdisciplinary connections, this type of "innovation" alone is not the whole story. He expands our ideas of creativity, to not merely include innovation, but to go beyond it—toward invention, discovery, and intuition—for a more complete and richer perspective on creativity, technology, and design, while maintaining its humanistic origins and goals.

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