



FORM IS FUNDAMENTAL

For the longest time, the constant lament of industrial designers has been that no one knows what we do.

Wikipedia knows: “Industrial design is a process of design applied to products that are to be manufactured by mass production. It is the creative act of determining and defining a product’s form and features.” Our IDEA criteria widen the scope to include: (1) Innovations that (2) benefit users and (3) the client/brand while doing good for (4) society with (5) appropriate aesthetics. Maybe we are bewildering our public when we say we also create services, design the behavior of the users, make manufacturing more efficient and greener, and originate reuse plans. Regular people simply say we design stuff like cars, chairs, and potato peelers.

“We are not building big and little gadgets—we are building an environment,” Walter Dorwin Teague, FIDSA, said back when products used to be objects. Now software engineers work on digital “products,” mathematicians have been making “products” (4 is the product of 2 x 2), and you even get financial “products” from your broker. That’s not so outlandish. Bill Moggridge, FIDSA, pushed the definition of how a product functions from hammering a nail to nailing an interface when he pointed out that everything is an interaction.

“The design of matter should matter to designers,” says RISD professor Peter Yeadon. Ayse Birsel wrote the book on how to *Design the Life You Love*. Brian Joseph Chesky and Joe Gebbia, RISD industrial design students, created the \$3.7 billion Airbnb based on renting air mattresses to attendees at an IDSA conference! Constantly blending and morphing, our field has expanding horizons. “Function” is a moving target and never was a single idea. The Ultimate Guide to Product Design course on Udemy declares that the “world finally understands the essential role of design.... But, the designer’s role has been changing over the last few years.” How are people supposed to comprehend what we do when we are always pushing beyond the limits?

Designing the Profession

What do you expect from a profession born riding on the 20th Century Limited? The roaring of the roaring '20s came from manufacturers demanding new products to feed their factories and merchants craving attractive things to sell to the expanding consumer market. It was an opportunity begging for a new profession. Theater set designers, window dressers, and illustrators who knew how to make

things look good dove into the growing gap.

Because industrial design did not originate evolving from an elite profession or have privileged patrons, the new practitioners had to prove their worth in the marketplace. Architects and craftspeople of the time, steeped in their own methods and procedures, did not adapt to the needs of the factory or the desires of the mass market. The “amateur” designers and educators took a fresh unbiased approach and quickly created new professional practices from the ground up. The practical necessity of giving form to ideas was the mother of all the design methods.

Their main insight was don’t start with the answer. Like Jason Belaire, IDSA, asks: “How else should they begin? Start with Phase 1: Explore: divergent investigation, survey the issues, understand the scope: then Phase 2: Discover: speculate, create many ideas, sketch out concepts, get user feedback and converge; then Phase 3: Develop: refine the best schemes, test and iterate again; finally: Phase 4: Deliver for production—in this case, the design process.”

What’s remarkable is they created the design process using the design process. (Is that why it’s so good?) Is it so remarkable that using that design process leads to better designs?

Made in America

Industrial design was born from practical working-class needs. This new American profession sprang from shop class, not the Bauhaus. Donald Dohner, FIDSA, taught in Pittsburgh’s public trade schools and at Carnegie Tech (now Carnegie Mellon University) as he worked designing Deco-style melamine trays and electric locomotives as an “Art Engineer” for Westinghouse. While he was developing the new design program at Carnegie, he moved to the Pratt Institute, using the iterative process at both places to create the design profession and the education curriculum we use today. He brought in Alexander Kostellow, FIDSA, to direct Pratt’s first-year experimental program Design and Structure.

One belief Dohner and Kostellow shared with the Bauhaus was that all art and design students should begin their studies with a common basic course. The Germans called their freeform survey *Vorleher*. Pratt named it Foundation because they conceived it to lay a firm foundation for the design curriculum. The Foundation course was the first stage in systematically introducing students to the fundamentals of materials, form, and color and how to

see and draw. Rowena Reed Kostellow, FIDSA, developed the primary series of exercises that like music scales, everyone can practice.

Kostellow and Reed realized that teaching abstract principles of design could free designers (and artists) from arbitrary and subjective constraints by giving them a set of more objective tools with a new visual and verbal vocabulary. "New York is where the idea of abstraction comes into its own with Abstract Expressionism creating a counterpoint to realism," Bruce Hannah, IDSA, observed. "At Pratt we see the history of abstraction and how it allows individuals freedom of expression through rigorous objectification of form by the manipulation of color, texture, line, volume, tone and plane." The Pratt curriculum quantified design education with a pedagogy scaffolding that integrates form study and production methods. The combination of form and function gives beauty power both as a creative generative force and for complex problem-solving that the industrial design profession was born for.

Housewares historian Vicki Matranga, H/IDSA, recently sent me an email that Budd Steinhilber, FIDSA (Pratt class of '43), sent to Cooper Woodring, FIDSA, about Donald Dohner: "In 1934, *Fortune Magazine* published that article about the new profession of industrial design (ghost-written by George Nelson, FIDSA). The article mentioned that Dohner had a staff of 8 designers and noted that the annual cost of the design department was \$75,000. A Westinghouse Vice-President was so incensed that this huge sum was being paid to 'a bunch of goddam artists,' Dohner was fired from his role." That didn't stop Dohner's pedagogy from flourishing and spreading around the world. (But maybe it is the reason we avoid being called artists?)

Form Follows Fingers

It's literally a reality check: You can't BS your hands. Thinking with our hands is our superpower. Our hands put us in touch with reality. Like hands-on progressive kindergarten education, learning by doing stimulates visual and lateral thinking, activates brains, and builds muscle intelligence. Eye-hand coordination is embryonic and transdisciplinary, integrating intellectual skills and physical skills. To teach a person to swim, they need to jump in the water; likewise, designers need to work in the shop. Working in 3D transforms ideas into tangible results. This activity is the portal to multidimension thinking, problem-solving in other dimensions that includes the multi-sensual, the multi-emotional, and the subconscious.

Working in the shop not only delivers beautiful proof-of-concept physical results—the powerful hallmark of industrial designers—it is also the gateway to design thinking and the source of our design process. "Rowena Reed taught three-dimensional design," Hannah says, "the way Mr. Miyagi taught karate in *The Karate Kid*. You thought you were doing something ordinary but you really were learning something extraordinary."

Design is everywhere. "Hidden in plain sight," says Bruce Mau. When we teach students to design real things, they learn how to peel away the subjective ("I like it")

and negotiate ingrained cultural bias in the quest to see objectively and empathetically. By learning to manipulate the abstract basic elements of physical form and composition, students build visual literacy, organization skills, and an aesthetic eye. They learn a vocabulary to critique and understand design.

"Determining and defining a product's form and features" (as Wikipedia says) we now understand includes useability, modular thinking, UX, branding, and service. Of course, everyone's doing design thinking now on any project. With design methods moving mainstream, industrial design's essential form-giving job is getting eclipsed.

Education is mirroring the shift of our multiverse profession with a pile-up of courses like crowdfunding, food design, and SolidWorks Essentials, short-changing actual design studios where students learn how to make designs. And they are squeezing in more research, innovation, and ethnography into those studio classes, leaving students with even less time for sketching and making real-world results in the shop. I asked my senior students how many design classes they have taken. They said they have had only one—Space/Materiality—and it was in their foundation year! Taking cues from the program's structure and general cultural trends, of course, the students' capstone projects also inflate up-front analysis. They spend too much time setting up their projects and telling stories, like knowledge workers, and then run out of time to design.

Teaching students to make things with their hands is not just a good way to style products; it is the gateway to truth.

Our shape-changing profession requires something like *My Octopus Teacher*, building on the fundamentals of form-giving. All students today face a massive change ripe for using their multi-talents built on a foundation of four-dimensional reality. In the beginning, educators defined our profession, and it turns out that pedagogy and the design process they created are applicable to everything from kindergarten to the space station. Now we all must use it to design a better, more sustainable environment.

No one cares what Leonardo da Vinci's job was. Why do we waste so much time trying to explain our job? "A system of education is not one thing," wrote Dr. W.E.B. Du Bois. "Nor does it have a single definite objective, nor is it a mere matter of schools. Education is that whole system of human training within and without the schoolhouse walls, which molds and develops men." Everyone is designing both hardware and software that will be the future. As Rowena Reed Kostellow said, "Pure, unadulterated beauty should be the goal of civilization."

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