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Probe to Learn, Probe to Design

Probes provide a powerful way of exploring a space. Bill Gaver and his colleagues gave people in elderly communities small packages of beautiful maps, cameras, and postcards that could be mailed back with intimate fragments of life [1]. They probed for glimpses of local culture to inspire their design process.

David Kirsh observed how ballet choreographers make small body movements in ways that at first blush look irrelevant to the task [2]. The choreographer's seemingly random shoulder shrug turns out to be quite intentional. They recruit their bodies to perform “epistemic actions”—dynamic probes—to visualize and feel movement possibilities.

What can interaction designers learn from shoulder shrugs and bespoke packages that serve as creative inspiration?

Such probes are tiny little excursions into a complex space. If done well, they reveal a lot. Consider space probes, congressional probes, or surgical probes. People leverage a unique human ability to think *through* probes—objects, bodies, other structures—to extend their reach and learn about the world.

This is essential in design, where one must learn the complexities of a problem before trying to solve it. Probes enter a design space, allowing a designer to strike up a conversation and to grapple with ambiguity. Why not embrace probes of all shapes and sizes?

My research group has been exploring how to use the Internet to probe various design spaces [3]. It started the year I first taught design courses and evolved with the Mobile Service Innovation course I co-taught with Jim Morris at Carnegie Mellon University. With a goal of innovating startup solutions for real problems, we wanted students to step outside the

typical boundaries of the classroom—both physically and metaphorically. We told the students, “Don’t listen to our opinion on what might be an important problem to tackle or a desirable solution to chase. We are likely to be wrong. Go interact with the world.”

So the students left the design studio. They modeled themselves on interaction design practitioners—conducting interviews, observing people in different environments, testing prototypes. Nothing out of the ordinary. Yet, in the context of a university course, we observed that students often face time constraints and geographical barriers. They can interact with only a few people, so their probes are rich but provide a thin slice of understanding. How might we scale this so that student designers will consider a wider range of alternatives and interpretations?

For us the Internet became a frontier for expanding this notion of a design probe. For example, we taught students to rapidly create user-scenario storyboards and to post them online for feedback, a kind of a social-network-fueled version of Scott Davidoff’s *speed dating* technique [4]. The speed at which early-stage design concepts can be shared enables a “conversation with the world,” aimed not at finding specific solutions, but rather at identifying potential stakeholders and discovering their diverse needs and desires.

Concrete solutions come later in the process. To help students measure the potential value of a service business concept, we invented a new probe. Well, OK, we borrowed techniques from marketing. Students create multiple variations of a homepage for their mobile startup concept. This is *before* they mock up any mobile UIs. Then we give student teams a small budget to

Figure 1. Students in UCSD’s startup class advertise their landing page to measure demand for their concept before building anything. This also allows them to A-B test different branding options.

launch an online ad campaign.

This “ad probe” has several virtues. Beyond revealing opinions, click behavior exposes authentic needs and desires. Students can gauge interest in their business idea. Garnering clicks gives students confidence that their ideas have merit. Students might also use this opportunity to A-B test different brands or value propositions, and actively learn about data-driven design. They build skills in data analysis and social computing that may set them apart in the job market.

Figure 1 shows an example of the kind of analyses students performed. This is just a quick student project, so don’t take the actual numbers or statistical test seriously. In an actual innovation setting, one would want the number of visitors to be at least an order of magnitude larger, but as a pedagogical tool this is powerful. In fact, the limitations of these probes can be discussed in class to deepen the educational value.

These crowd probes are meant to complement other design methods, not supplant them. For instance, our student teams also performed *service enactments*, a kind of minimal viable

product where the team wizards the service for real customers for a period of time. Just like the choreographer using her body, the embodiment of the service led to insights.

My point is not to single out specific probes as better than others, but rather to advocate their many forms. And to think about *how* we probe the world and how different probes yield different information. Probes can scratch the surface, uncovering sensitive tidbits about potentially vulnerable populations. Probes can be devised to answer specific questions, aimed at risky unknowns, or contrasted with other probes [5].

What’s the connection between Gaver’s cultural probes and Kirsh’s epistemic actions? There’s a theoretical answer and a personal one. The theoretical angle has to do with designers’ need to have a conversation with the world in order to grapple with the ambiguity and complexity of design spaces.

On a personal level, I recently learned that Bill Gaver, like many other HCI luminaries, is a Ph.D. alumnus of UC San Diego’s Cognitive Science

Department, where David Kirsh teaches and the place I now call my academic home. This department’s faculty pioneered theories of distributed and embodied cognition, foundational literature for the field of human-computer interaction. I’m excited to be here and to join the nascent efforts of the Design Lab, where we propose a novel mix of practice and theory—thinking, observing, and making—to explore complex sociotechnical problems through human-centered design.

On reflection, I have found that probes can be as useful for research as they are for design practice. This speaks to a deeper theory of how people form meaning through deliberate interaction in the world.

What are your favorite probes that you have tried or seen? I would love to hear about them. Interact with me!

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ENDNOTES

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