

EMPATHY INSIGHTS BY OBSERVATION, EXPERIENCE, AND INQUIRY

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1. INTRODUCTION

Henry Dreyfuss, one of the founders of industrial design, said, “The products we design are going to be ridden in, sat upon, looked at, talked into, activated, operated, or in some way used by people individually or en masse. If the point of contact between the product and people becomes a point of friction, then the industrial designer has failed. If, on the other hand, people are made safer, more comfortable, more eager to purchase, more efficient or just plain happier, the industrial designer has succeeded” (Dreyfuss 1955, 25–26). Dreyfuss, more so than his contemporaries, focused on design and its connection to people. This focus was the beginning of one of the core principles of design: the human connection or the human rule—the rule that states that all design activity is social in nature (Plattner, Meinel, and Leifer 2013). The ability to make this human connection in a meaningful way is called user-centered design (Norman and Draper 1986), and a key component of user-centered design is empathy (Kelley and Littman 2008).

2. WHAT IS THE ROLE OF EMPATHY IN DESIGN?

Empathy is the ability to understand, share, and relate to the feelings, thoughts, and experiences of another person. Empathic design is an approach that considers a user’s experiences, interactions, and emotional state associated with an artifact. The purpose of empathy in design is to identify users’ unmet needs and create products that meet those needs by making a human connection on multiple levels. The process of using tools of observation, experience, and inquiry to develop empathic insights results in useful products that customers did not even know they wanted. These insights allow designers to develop products that make human connections through considering aesthetics, meeting needs, and creating meaning. This deeper connection mitigates one of the primary risks in new product development—that customers fear or doubt whether a new product can meet their needs and expectations (Meyerowitz and Chaiken 1987). Achieving empathy in design relies on methods that engage with consumers so that designers can better understand the consumers’ needs and wants.

3. HOW IS DESIGN EMPATHY DEVELOPED?

Empathy is a result of deeper understanding, and understanding occurs when designers have an anthropologist mindset when they engage with others (Kelley and Littman 2008). In anthropology the methodology called *ethnography* is used to describe the culture of a group. Ethnography uses the terms *etic* and *emic* to describe two methods of connecting with communities. The etic method is observing the setting and its members as unobtrusively as possible from the outside, and the emic method is not only observing but also experiencing (Headland, Pike, and Harris 1990).

In addition to these two tools, inquiry is a simple but powerful means to gaining understanding. Inquiry involves talking to people, asking lots of questions, and listening carefully. The three practices of observation, experience, and inquiry are the simplest tools for understanding needs, and they are also easy to explain and demonstrate.

4. WHY IS DESIGN EMPATHY IMPORTANT?

Learning the unarticulated needs of users through a process of keen observation and interpretation often leads to breakthrough designs (Deszca, Munro, and Noori 1999). It is argued that market forces and competitive pressures in today's fast-paced world demonstrate the importance of product innovation as a source of competitive advantage (Friar 1995). The advantage is that products that make a human connection mitigate product development risk.

"Empathy makes you a better innovator," said Satya Nadella, the new CEO of Microsoft. "If I look at the most successful products we have created [at Microsoft], it comes with that ability to meet the unmet, unarticulated needs of customers" (McGregor 2017). Sohrab Vossoughi, president of Ziba Design (a product design consulting firm) said, "It's true that software has gotten much more powerful and easier to use, empowering millions of people to take on design tasks once reserved for professionals. The real expertise of product designers, though, isn't in their mastery of computers, but their ability to identify needs, create meaning and form a thoughtful point of view on what a design should do and why" (Vossoughi 2014).

Design is a deeply human process that taps into abilities that all people have, but these abilities are often overlooked in favor of more conventional problem-solving practices. Design relies on people's abilities to be intuitive, to recognize patterns, to construct ideas that are emotionally meaningful and functional, and to express themselves through means beyond words or symbols. Few organizations want to run an organization on feeling, intuition, and inspiration alone, but an overreliance on the rational and the analytical can be just as risky (Brown 2009). Failure to consider the social and cultural norms of the people for whom a design is intended can lead to costly misunderstandings. Coca-Cola, McDonalds, and Kodak are three examples of companies that failed to understand the complexity and uniqueness of social communities.

In 1985, Coca-Cola introduced a product they called New Coke. New Coke was the first formula change in 99 years to the original Coke recipe. The public's negative reaction was immediate, not because they didn't like the new flavor, but because they were annoyed that the version they were used to was no longer available. "The tacky way it was introduced made it seem as though the regular Coke drinkers mattered little to the company," said Richard Laermer (Investopedia 2011). Many of these drinkers were Southerners, some of whom considered Coca-Cola a fundamental part of their regional identity (Oliver 1987). The Coca-Cola company spent more than \$30 million on the new formula and \$4 million on taste testing. Why didn't the taste testing reveal what the customers wanted? It is suggested that the taste testing was flawed. Malcolm Gladwell (2005) states that interviews with food industry researchers blamed the nature of taste tests. Most of the tests were "sip tests," meaning that drinkers were given small samples to taste. Gladwell contends that there is a big difference between the "sip" and what people

actually drink at home. Seventy-eight days after the launch of New Coke the company brought back the original Coke with a new name, "Coca-Cola Classic."

On January 30, 1990, McDonalds opened a restaurant in Moscow, its first in the Soviet Union. McDonalds expected one thousand people to arrive at the new location on opening day, but instead, thirty thousand people arrived, making it the largest restaurant launch in history. People lined up for miles and waited for hours to pay the equivalent of several days' wages for a Big Mac, shake, and fries. McDonalds was not prepared for this turnout because the company did not understand the social and cultural impact the restaurant would have on the Russian people, and they didn't realize that it was not about the food (HistoryPod 2017).

In 2002, two of Kodak's last film cameras were developed for China and the Eastern Bloc countries of Europe. Extensive research was done to determine the needs of these consumer markets. The designers interpreted the research and used it in the development of two cameras, one a manual film advance camera and the other a battery-powered auto film advance camera. The cameras were at different price points, with the auto advance camera naturally being the more expensive of the two. However, an unusual phenomenon happened in the marketplace in China. The manual advance camera sold more products at a higher price than the auto advance camera did. The designers had missed an important aspect of this culture: the Chinese market thought the manual advance camera was more valuable because it used less battery power, which would mean that it would cost less in the long run. The designer failed to understand the cultural difference that affected the perceptions of the two cameras in this unique environment; hence, the designer lacked empathy.

In both the McDonalds and Kodak cases, the research these companies conducted was insufficient to develop the understanding or empathy for the cultures for which they were providing products. While the products were still successful, they did not address consumer needs as effectively as they could have if the companies had a deeper understanding of the market.

5. WHAT ARE THE RESULTS OF IMPLEMENTING EMPATHY IN DESIGN?

Using the practices of observation, experience, and inquiry to encourage empathy is a powerful design methodology. This paper shares eight case studies in which empathetic approaches to design have been successful. Three case studies highlight professional product designs, and five case studies feature student designs for educational industry-sponsored projects.

5.1 PROFESSIONAL CASE STUDY 1: OLIVETTI NA BANKING SYSTEM

In 1986 a designer working for a bank automation company was assigned to redesign the equipment used at the teller workstation. The equipment consisted of a video display, a keyboard, a magnetic strip-card reader, a processor, and a document printer. One of the first steps in the design process was to visit banks to observe and talk with the tellers about work patterns, their environment, and how they used the equipment. The results of the observation were clear: space was at a premium, and the equipment was taking up all the available real estate. The designer observed that tellers had made makeshift receipt holders out of cardboard and had taped them to the top of the printers to make every surface useable. The empathy insight that drove the redesign was that the equipment needed to take up less space in order to make the tellers' work area more comfortable and useable for other important tasks. This drive to

save space led to a number of innovations. The first was to combine components by integrating the magnetic-card reader into the keyboard, an innovation at the time that has since become standard. The second was to develop shared printers after it was determined that every teller station didn't need a printer. The third was to incorporate a stand to reduce the footprint of the video display. In the end, the redesign reduced about 30% of the equipment's footprint and, more importantly, made the tellers' work spaces less cluttered, more comfortable, and more efficient (Skaggs 2010).

5.2 PROFESSIONAL CASE STUDY 2: ICON HEALTH AND FITNESS TREADMILL

In 1997 a designer consulting for the large exercise equipment manufacturer ICON Health and Fitness was assigned the task of designing a new treadmill. The market was crowded with treadmills, and the designer wanted to create something to differentiate the new design. Using a camera and a sketchbook, the designer observed treadmill use in homes and in clubs. Data collected from the observation uncovered an unusual behavior pattern. People came to treadmills holding a variety of personal items, such as water bottles, towels, keys, cell phones, and magazines or novels. They searched the floor for one of a number of pieces of bent plastic (an aftermarket magazine rack) then put the plastic on the treadmill console to hold their magazine. They slid the rack to one side to reach the controls they needed to program their workout, then slid it back to the middle to easily read their magazine during their workout. However, in this position the magazine covered the console displays, so throughout their workout, users occasionally slid the reading material to the side to check their time, calories, or distance on the console displays and then moved the rack back into place. Users did this three or four times during a thirty-minute workout. Overall, people tended to use the console displays for five minutes and the magazine rack for twenty-five minutes.

Observing how people used the treadmill created an empathy insight that resulted in a console with a built-in magazine rack in the middle and controls and displays on the side and bottom. Although a simple concept, this design had not yet been available for home or club exercise equipment. This innovation was integrated not only into the treadmills but also into the ellipticals, stair-climbers, and bike consoles of all of ICON's brands. Today, this design is standard in exercise equipment (Skaggs 2010).

5.3. PROFESSIONAL CASE STUDY 3: DEWALT WORKSITE RADIO

Leading tool manufacturer DeWalt was interested in creating a new product category to drive new growth within the company. The manufacturer turned to an industrial design firm, Altitude, for help (Altitude 1998). Altitude's designers spent time at numerous job sites, observing and working with the contractors and querying workers about what they felt was important to their productivity or to their overall job satisfaction. The research led to a surprising discovery: the need for a robust radio. At the time, the average contractor was going through three or four radios a year, watching standard boom boxes quickly fall apart from rough treatment, dust, and other job hazards. So far, no one had considered designing a radio specifically for use on job sites where entertainment is an important part of productivity and morale. To cater to this need, the designers created a radio that looked and acted tough, with a roll cage on the exterior to protect it from harm, a durable rubberized antenna, oversized knobs for use by gloved hands in any weather, and a non-LCD control panel visible in any light. DeWalt sold 1.5 million units in the first year, making the DeWalt Worksite Radio the best product launch in the company's history, far surpassing industry standards.

5.4. STUDENT CASE STUDY 4: MOTOROLA RADIO

In a 2007 sponsored project with Motorola Radio Division, industrial design students were asked to develop radios for first responders. The students began this project with the principle of inquiry, questioning first responders to identify unique, unmet needs. One student discovered an area of interest in the response to Hurricane Katrina in New Orleans. Each emergency relief agency had painted its own codes on the buildings as the first responders evaluated needs. This setup, with each agency using its own codes, led to a lot of miscommunication and repeated building checks—some buildings were evaluated by three different relief agencies. Using this empathy insight, the student developed a first-responder radio with an RFID (Radio-Frequency Identification) tag printer and reader. Using this radio, first responders would be able to tag the buildings they checked, and all other agencies would then be able to use their radio from a distance to read what the tag said about that specific building. This system would greatly improve communications between disaster relief workers. The presentation of this concept to Motorola’s design management received a very positive response (Haymond 2007).

5.5. STUDENT CASE STUDY 5: CUTTERS BASEBALL PITCHER HEAD PROTECTION

In 2010, Cutters, a protective sports gear company, sponsored a project with the industrial design program at Brigham Young University to develop baseball pitcher head protection. The need for protection was a growing concern because pitchers sustain serious head injuries by balls that are hit back at them. A couple of the students did some research and found a young man in California who was critically injured during a high school baseball game. The sixteen-year-old pitcher was struck in the right temple by a line drive ball hit off a metal bat. The students called the injured young man and asked if they could talk to him and then traveled 646 miles to California to interview the player. Several empathy insights came from the interviews. One student said, “I would say this project has really opened my eyes when it comes to the importance of questioning people to find the real problems. Interviewing people is awesome because you can see things from their perspective and the problems become more obvious, and, at the same time, the solutions seem to present themselves.” He continued, “Without others’ perspectives, I would have just used my own assumptions” (Smart 2010). The empathy insight story and a well-executed design produced a persuasive solution to the pitcher protection problem and was very well received by Cutters management.

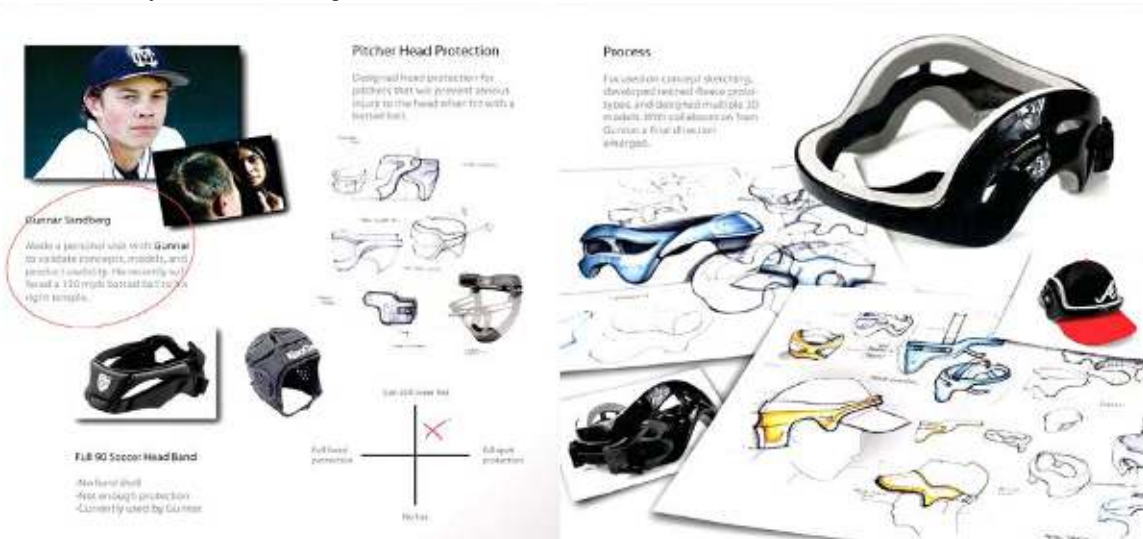


Figure 1. Student presentation to Cutters of pitcher head protection.

5.6. STUDENT CASE STUDY 6: PRIDE MOBILITY POWER CHAIR

In 2010 Pride Mobility sponsored a project with the BYU industrial design students to redesign their low-end power chair. The industrial design program requested that Pride Mobility donate five power chairs to give the students first-hand experience using the product, and the students gained multiple empathy insights from the chair experience. Here is one student's description of the project from her student merit award presentation:

Pride Mobility asked us to redesign their low-end power chair. I immediately needed to know why someone uses a manual chair over a power chair. I remember walking around campus all day till I found Amanda. Amanda became a paraplegic after a car accident in her teens. She told me she uses a manual chair because it gives her a sense of well-being from cardiovascular exercise, and that she has pride in her upper-body strength. But she did concede that some years she had to use a power chair because she wasn't confident that she could travel the long distances between her classes. The goal became immediately apparent—I needed to design a chair that gave Amanda all three—pride, confidence and well-being.

Next I spent about 2 weeks testing the existing chair. I remember getting pulled out of the snow three times on my way to school. But what was most inspiring to the design was the emotional experience I had in the chair. Not only could I start to empathize with Amanda and her memories, but I started to feel disconnected to my body. I was becoming a machine, with a power button that beeped to announce pending movement.

As I moved into the ideation and sketching phase, I knew I wanted the visual design to be driven by the emotional experience I had in the chair. It needed to feel like an extension of the human body—centered on the most important point of the interaction—the seat itself. The spine became a metaphor for the seat. The solution was a hybrid manual/electric chair . . . the user operates the chair manually, and the motors housed in the wheels supplement that power when needed—like an electric bike. The client, Pride Mobility, was happy with this user-centered approach, but the most rewarding part of the project was seeing Amanda's excitement for the idea. (Budge 2011)

5.7. STUDENT CASE STUDY 7: BONTRAGER BIKE HELMET

In 2014 the industrial design program at Brigham Young University worked with bicycle manufacturer Trek/Bontrager on a sponsored studio project. The company wanted the students to design bike helmets for urban commuters who used a bike as their primary form of transportation. To begin this task, the students created bike helmet mockups with dollar store bowls and riveted nylon straps (see figure 2). The goal was for the students to keep the mockup with them all day for two weeks to help them develop empathy for urban commuters and understand the problems they may encounter. After this experience, the students developed a series of empathy insight personas. These personas captured the discovered needs of the urban commuters, which included simpler, less aggressive forms than that of the traditional bike helmet; more fashionable materials; the capability to ride at all times of day in all weather conditions; and simplified straps and adjustment. The students presented sixteen concept models that met these identified insights. The project received high praise from Trek/Bontrager design management. The design concepts also received a lot of positive press for the industrial design program and the university (Skaggs 2014).



Figure 2. Students with bowl helmets.

5.8 STUDENT CASE STUDY 8: BLACK DIAMOND PROJECT

Black Diamond sponsored a project with BYU's industrial design program to design lighting products for a specific recreational market niche. The market niche was left up to the students to discover, explore, and understand.

One student discovered canyoneering, a recreational activity that combines route finding, rappelling, swimming, hiking, and exploring canyon and cave systems. Headlamps are standard lighting equipment for canyoneering, and through observation, experience, and inquiry, the student uncovered a number of empathic insights: Canyon and cave environments are harsh and made up of rock, sand, and water. These environmental aspects affect the product, so the headlamps need to be rugged and waterproof. The abrasive, cold, wet, and restricted environment also affects the user, who must wear gloves to protect hands from the ropes used to rappel from the abrasive rocks and to protect them from the cold. As a result, the user interface on the headlamp needs to compensate for the diminished tactile acuity. Selecting lighting modes, changing batteries, putting the headlamp on, and taking it off all need to be accomplished with limited dexterity caused by the gloves. The student was able to address many of these issues with the canyoneering headlamp he developed. The success of the project was measured by selection, and out of the sixteen ideas the BYU students presented, this design was one of the three that the design staff chose to be presented to upper management at the Black Diamond offices.

5.9 STUDENT CASE STUDY 9: BLUETOOTH DOOR OPENER

In an article titled "A Startup That's (Literally) Opening Doors for Wheelchair Users," *Forbes* magazine documents one student's incorporation of empathy in the practices of observation, experience, and inquiry. The article reads in part as follows:

About six months ago, Sam Lew, an undergraduate industrial design student at Brigham Young University, was out and about on campus when a woman in a wheelchair asked him to help open a door. That got him thinking about how difficult daily life must be for any student with similar disabilities.

Lew, however, was in a position to do something about it. A member of an undergraduate team in the University's Crocker Innovation Fellowship, . . . he discussed his thoughts with his five colleagues. After some research, they decided to focus their efforts on inventing a better way for wheelchair users to go through entrance ways. . . . The ultimate goal, says fellow co-founder Connor McLeod, is "to make the world more accessible to people with physical disabilities." (Field 2017)

At first, the team members did not know exactly how to focus their energy. Then, after Lew explained his experience, the team decided to have a lengthy, in-depth conversation with the wheelchair user whom Lew had met. She shared what her daily life was like, and, from that conversation, said Lew, they "were able to pull out insights that gave us our idea."

What the team developed is a device that attaches to the motor of an automatic door. The device is designed to be retrofitted onto existing door openers, and it opens the door after detecting Bluetooth signals from a user's phone. The team recently launched a pilot to test the product at a university.

6. CONCLUSION

A recent graduate from the industrial design program who was hired by the Little Giant Ladder company was asked to design accessories for their line of ladders. This was his first professional product design experience, and he approached it like he had been taught in school. The designer observed numerous and varied work sites where Little Giant ladders and also competitors' ladders were being used. The designer noticed that the top caps of the ladders had been designed with features for tools, but they were not used as imagined. Instead, users had made modifications that allowed for hammers, screwdrivers, tape measures, paint brushes, and fastener containers to be easily accessible on top of the ladder. This led to the design of a tool pouch, called the Cargo Hold, that attached to the rungs of the ladder to give easy access to a variety of tools. The Cargo Hold is a very successful accessory for Little Giant Ladder, but, more importantly, it changed the way Little Giant approached their design process. Moving forward, they adopted human-centered design in the development of their products. Using the tools of observation, experience, and inquiry for customer insights became standard practice and led to more successful ladder products and features (Boynton 2016).

Developing empathy for people by coming to understand their needs through observation, experience, and inquiry in product and service design has proven to be effective. In a high-risk venture like product development, any idea that can help mitigate risk is valuable. Empathic design is one of the tools that designers are using effectively to lower the risk of innovation. Henry Dreyfuss stressed empathy as an indispensable mindset for successful designers in 1955, and this idea remains relevant today. As prominent industry leaders like Satya Nadella, the CEO of Microsoft; Sohrab Vossoughi, president of Ziba Design; and Tim Brown of IDEO have suggested, empathy truly is a key element in successful design thinking.

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