

OBSERVATIONAL RESEARCH. FORMALIZING CURIOSITY

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Purpose

This paper's function is to present observational research as a design research method. It presents what observational research is and what it is not. It discusses the value of observational research to the product design professional and to the product development process, the importance of the designer participating in the observation, and how observational research plays a role in problem finding, an important aspect of innovation.

What is observational research?

A dictionary defines observation as “1. paying attention: the attentive watching of somebody or something 2. observing of developments in something: the careful observing and recording of something that is happening, 3. a remark or comment on something that has been noticed and 4. a record of something seen or noted. Each of these definitions applies to our thesis.

One definition of research is “Research is formalized curiosity; it is poking and prying with purpose.”¹ Research is systematic investigation to establish knowledge. In a research survey on the aptitudes for entry-level industrial designers, curiosity was mentioned most often as an important aptitude for a designer². Great designers are curious—they want to know who, what, why, how, when, and where, and what if: they poke and pry. Einstein said,

It is nothing short of a miracle that the modern methods of instructions have not yet entirely strangled the holy curiosity of inquiry;...It is a very grave mistake to think that the enjoyment of seeing and searching can be promoted by means of coercion and a sense of duty.³

It is hard to teach students a passion for curiosity if it doesn't come naturally, but we can teach research methods that will help them experience the power and results of curiosity. Observational research is one of those methods.

Much has been written about ethnography in product design. Ethnography is a valid method of research for design but is not the subject of this paper. Observational research is similar to ethnography in process, but the results the designer is looking for are different than what the anthropologist is looking for. The ethnographer is looking for generalities; the designer is looking for specifics. The ethnographer is concerned with analysis; the designer is concerned with synthesis. The ethnographer is avoiding making judgments; the designer is required to make judgments; the ethnographer looks at a prolonged activity; the designer requires information quickly.⁴

Observational research is the attentive watching and recording of somebody or something in a systematic way to establish knowledge.

¹ Zora Neal Hurston

² Paul Skaggs, *Aptitudes for Industrial Designers*, (IDSA Educators Conf. Proceedings, 2001)

³ Teresa M. Amabile, *Creativity in Context* (Westview Press, Inc., 1996), 3.

⁴ Amy McCleverty, *Research Methodologies*, (1997)

Why is observational research important to designers?

Innovation is an important part of design thinking. Innovation is application of creative thought and an important element of creative thought is problem finding. Observational research is an important tool in problem finding. Observational research introduces the designer to the user(s) of the product. It introduces to the designer how the product could be used. Observational research introduces the designer to the setting where and when the product will be operated. Observational research is a way to help designers know what the product should be. Observational research can help develop products to meet more of the needs of the consumer and market and thereby reduce the risk of the new product introduction. Observational research also provides opportunity for innovative ideas that may have been otherwise missed. Observational research is a formalized way to help the designer develop and utilize his curiosity, and his desire to poke and pry.

Who does the observing?

Now that business has discovered ethnography, research firms are being established to provide observational research. The designer who is directly involved in the project development should participate in the observational research. Designers know they are looking for something, they just do not know what it is, but when they see it, they will know. Research reports, no matter how complete, will filter out things that may be termed unimportant or outside the parameters of the research, but in reality may hold the key to the designer's innovation.

Designers can use the observation as a mental benchmark as they explore concepts for the product. The designer's mind will go back to the environment and users and provide a context for the concepts fitting the setting and relating well to its members.

Participating in the observation will allow the designer to make better decisions about the design. Nothing can substitute for the designer's hand experience in seeing the setting and its participants, the context that the product will be used. In the NBC's Nightline piece "The Deep Dive" profiling IDEO's design process, David Kelly said a designer who is at his/her desk all the time is not getting the job done.⁵ Designers need to get out and poke and pry.

How is it done?

Emic and *Etic* are terms used in ethnography to describe methods of observing, they also apply to observational research. *Emic* is an insider approach, observing the setting and its members by participating in the setting with its members. *Emic* is not only observing but also experiencing. *Etic* is observing the setting and its members as unobtrusively as possible outside the setting.⁶ Both approaches have merit for the designer. If both approaches are deemed valuable to the project, the designer should take the outsider's approach first, then the insider's approach. This allows the designer to observe the setting and its members acting naturally. They are not aware they are being observed. Then if participation, conversations or interviews are part of the observation, they can be done without affecting the outsider's uninhibited observation.

⁵ Ted Kopple, The Deep Dive (Nightline NBC, 1999)

⁶ Thomas N. Headland, Kenneth L. Pike, and Marvin Harris, *Emics and Etics* (Sage Publications, Inc., 1990)

The best tool for observational research is the designer's knowledge, vision, and memory. A camera and a sketchbook/notebook serve as tools that are reminders of what is observed. A video camera can also work if someone else is operating the equipment, allowing the designer to focus on the larger context. With a video camera, the setting becomes narrowly focused. The observer can sketch, make notes and take pictures while in the observational setting. Sketches are less obtrusive than pictures, and pictures are less obtrusive than video. Notes, sketches and photos can be used as reminders and presentation tools.

What are the results?

My personal experience is this, I don't remember who taught it or how, but I came out of my undergraduate training with observational research as a part of my design process. That was twenty-five years ago. I have found it to be very valuable in my approach to a design problem and was surprised to learn that not all designers used observation as part of their process. My approach has always been very informal but effective.

My first job out of school was working for a manufacturer of computer equipment for automating banks. I was to redesign the system, which consisted of a video display, a keyboard, a magnetic strip-card reader, a processor, and a document printer. One of the first steps in my process was to start visiting banks and observing the tellers work patterns, environment, and how they used the equipment. It was easy to get permission to observe in the banks that had our equipment installed tellers were anxious to help make their work easier and more efficient. The results of the observation were simple. Space was at a premium, and our equipment was taking up a large portion of the real estate at each teller station. My goal was to save space. I set an arbitrary goal to reduce the system footprint by 30%. We accomplished this by combining components. We integrated the magnetic card reader into the keyboard, a real innovation at the time, developed shared printers, reduced the footprint of video display, and made the work surfaces more useful. The existing document printer had a sloped top that made the surface unusable. In my visits I saw that some tellers had made makeshift receipt holders out of cardboard that were taped to the top of the printers. The new printer design had a flat top with an optional rack designed to hold blank receipts, deposit slips, and other paper products.

That was my first "real world" experience with observational research, and it was very successful. Observational research has been a part of my process ever since.

The following five case studies demonstrate the effectiveness of observational research for designers.

Case Study 1

While consulting for an exercise equipment manufacturer, Icon Health and Fitness, we were given the assignment for a new home-use treadmill. The market was crowded with home-use treadmills, and we wanted something to differentiate our design. Home observation was a difficult arrangement so off to the club I went with camera and sketchbook to sit and observe the use of the treadmills. I was in the club about five minutes when I noticed a very unusual behavior pattern. People came into the area with a water bottle, towel and a magazine or novel. They searched the floor for a piece of bent plastic, an aftermarket magazine rack. They put the rack onto the treadmill console with their magazine. They slid the rack to one side and programmed their workout. They then slid the rack back to the middle and start of their workout while reading

their magazine. On occasion during the workout they would slide the rack to the side to see the displays on the console, to check their time, calories, or distance, and then slide the rack back into place in the middle of the console. This they did three or four times in a thirty-minute work out. In a thirty-minute workout, they used the console for five minutes and the magazine rack for twenty-five minutes.

That was one of our innovative ideas--a console with a built in magazine rack in the middle and the controls and displays to the side. The design director was so excited by our discovery that he pledged that every treadmill, elliptical, stair-stepper, and bike would have a console with a magazine rack built in. Every time I visit Sears or other exercise equipment outlets I look to see if he has kept his commitment, and to this day, six years later, he has.

Case Study 2

I was given the task of designing a vertical bar-code scanner for a client. The PRD (product requirements document) from marketing said that this product would always be in a vertical orientation and needed to have a speaker on the front. Marketing had found in past products that the speakers on the side or back were never loud enough and were often covered by other items in the checkout area. I asked for a list from the marketing group of installed competitors' products in the local area and was surprised they had no idea where to look. I started to wander. I found a competitor product installed in a Barnes and Noble bookstore. It was mounted horizontally under a glass top. I took a couple of pictures of the installation. The problem with our PRD was that with the speaker on the front, it would be right up against the glass top and would never be heard. The horizontal configuration also required that the front of the product be flat to allow a smooth interface with the glass and a more versatile mounting scheme for both vertical and horizontal configurations. The client changed the PRD to include these changes in the design, and we proceeded with the project.

Case Study 3

Fisher-Price has tried for a couple of years to develop their ELA (electronic learning device) category of toys to compete with the very successful LeapFrog and VTech products. We were given the task of developing some concepts for unique ELAs. Our first step was to try and understand how these products were used. We gathered a large box of Fisher-Price and competitors' products, received permission from a local preschool (the product's target audience) and the parents to video tape the children's interaction with the toys. We were allowed to video a segment of the daily routine at the daycare that was designated as playtime. This was so our observation wouldn't interrupt the regular school day activity. We tried to be as unobtrusive as possible in a classroom of four and five year olds. The attention was on us until we brought out the toys; then we were quickly forgotten. We filmed about five hours of pre-schools on different days playing with, sharing, discarding, fighting over, and interacting with the toys. The important observation came on the second day of filming that was outside of our research parameters. At the end of the playtime session was recess. The students were immersed in the toy research playing with the plethora of new toys when the recess bell rang. The toys were dropped in an instant as the students lined up to go outside. The video had been shut off and was being packed up when the teacher took the students outside. I wandered out to further observe what was going on. The children were having a great time playing, laughing, running, jumping, and swinging in the summer sun. They were having far more fun than they did with any of the toys. The teacher was involved in organizing recess activities like Ring around the Rosy, Red Rover and the like.

The ELA concept that we presented to Fisher-Price was an outdoor product, called Jitterbug. The product looked like a bug and when you “danced” with the bug it would give you a series of tasks to do, such as run, jump, and hop on one foot, while teaching the alphabet, numbers, colors and co-operation. A side benefit to the Jitterbug we learned from another project is that people learn and retain better when they are using your large muscle groups, for instance, if you read while walking on a treadmill.

Case Study 4

Another exercise equipment client, Weider/Jumpking, asked us to design a new set of free weights. Off to the club I went to observe how weights were used. I saw a young female lifting 45 lb. weights onto the bench press bar. The weight was heavy and hard to hold. She was struggling to try to line up the hole in the weight with the bar. The weights were vinyl coated with different colors to give a visual clue to the pounds. The 35 lb. weight was yellow and looked very worn. A series of ideas came out of this observation. The result was a set of weights with a handle on both sides and a lead-in to align the bar with the hole. We also used vinyl to differentiate the weights but used an “o-ring” approach. The vinyl went around the outside edge where the vinyl really serves its purpose. This has been one of the best selling weight sets that Weider/Jumpking has ever introduced.

Case Study 5

One of my clients was bidding a job for a package tracking system for UPS. I got the client to get permission for me to ride along with a UPS driver on his delivery route. I rode with a driver for three days on three different routes as an observer-participant. The client did not get the contract, so the project was dropped, but to this day when I see a UPS truck I have a flood of memories about the experience. I know how the drivers start the day, how the routes are organized. I know why they move so fast. I know their priorities when they enter an accounts office. I know why they only take the required thirty minute lunch break and not a minute more. I know how they end the day.

Conclusion

I have been in banks observing tellers, grocery stores observing cashiers and check out patterns, Federal Express hub and sub hubs observing package sorting. I have ridden in a tractor-trailer observing the life of a truck driver. I have ridden with UPS drivers observing and participating in package delivery. I have been in upscale clothing stores observing checkout procedures, hospital emergency rooms observing patient transporting, medical labs observing technicians, and McDonald’s observing the taking and filling of orders.

Observational research should be part of the design process that we practice, preach, and teach. We should practice formalized curiosity as a tool for problem finding. Designers will be more innovative if they understand and use observational research as a part of their design process.