Design and the User Experience: The Turkish Context

Isil Oygur and Nancy Blossom

As industrial design practice turns to the design of *experiences* through products and services in the twenty-first century,[1,2] new approaches to design research and the design process are called for. Design research is increasingly informed by social science methods; user-centered design[3] and experience-based design[4] are becoming commonplace in design practice. In this context, the *relationship* between the designer and the user is significant in the incorporation of user input into design.[5]

For the most part, it is assumed that each user research method will have a positive effect in building pleasant user experiences. Although rigorous studies on the subject are found in business anthropology[6,7] and extant social science literature,[8] most of these studies concentrate on the research phase and the fuzzy front end of the design process.[9,10] As a result, our discipline's knowledge of the effect of various user research methods on the problem and solution spaces of design and on the end-user experiences is limited. This lack of in-depth theoretical background specific to design disciplines renders a shallow understanding of these concepts and their applications.

This article looks at multiple case studies for a better understanding of the effect of user research methods on the design process and the design outcome. The context of the study is the emerging economy of Turkey. Eight products that were designed, developed, and manufactured by Turkish designers, engineers, and firms were selected as cases. The problem is specifically approached from the perspective of the designers' role in the process. Although user research is spreading all around the world, economic problems and time limitations mean that the number of design firms that conduct user research and employ design researchers in addition to designers is still limited.[11] This situation is exemplified in the Turkish context. In this environment, design research is one of the main responsibilities of designers who are often untrained in research methods. The qualitative analysis of these eight cases not only provides insight on the designer's attitudes and approaches to user research in this specific context but also sheds more light on the value of different user research methods in developing experience-based products.

1 B. Joseph Pine II and James H. Gilmore, "Welcome to the Experience Economy," *Harvard Business Review* July–August (1998): 97–106.

2 Jane Fulton Suri, "Designing Experience: Whether to Measure Pleasure or Just Tune In,?" in *Pleasure with Products: Beyond Usability*, ed. William S. Green and Patrick W. Jordan (London; New York: Taylor & Francis, 2001), 162–174.

3 Karel Vredenburg, Scott Isensee, and Carol Righi, *User-centered Design: an Integrated Approach* (Upper Saddle River, NJ: Prentice Hall, 2001).

4 John Cain, "Experience-based Design: Toward a Science of Artful Business Innovation," *Design Management Journal* 9, no. 4 (1998): 10–16.

5 Victor Margolin, "Getting to Know the User," *Design Studies* 18, no. 3 (1997): 227–236.

6 Ann T. Jordan, *Business Anthropology* (Waveland Press, 2002).

7 Melissa Cefkin, ed., *Ethnography and the Corporate Encounter: Reflections on Research in and of Corporations* (New York: Berghahn Books, 2009).

8 See, for example, Steve Woolgar, "Configuring the User: the Case of Usability Trials," in *A Sociology of Monsters*, ed. John Law (London: Routledge, 1991), 57–102.

9 Jonathan Cagan and Craig M. Vogel, *Creating Breakthrough Products: Innovation from Product Planning to Program Approval* (Upper Saddle River, NJ: Prentice Hall PTR, 2002).

10 Darrel Rhea, "Bringing Clarity to the "Fuzzy Front End"," in *Design Research: Methods and Perspectives*, ed. Brenda Laurel (Cambridge, MA: The MIT Press, 2003), 145–154.

11 Caroline Hummels, Johan Redström, and Ilpo Koskinen, "Design Research for Social Scientists: Reading Instructions for This Issue," *Knowledge, Technology & Policy* 20, no. 1 (2007): 11–17.

The Designer-User Relationship in the Twenty-First Century

The professional act of designing artifacts is a social phenomenon that aims to fulfill users' tangible and intangible needs.[12,13] Reaching this goal requires knowledge about the intended users of a proposed artifact. Although this knowledge of end-users has shaped the design process from the very beginning of the industrial design profession,[14] at the end of the twentieth century, gaining knowledge about users has been increasingly grounded in qualitative research methods borrowed from social sciences.[15,16,17]

A wide variety of research methods (e.g., action research,[18] cultural probes,[19] and ethnography[20]) have entered into design territory. These methods are used to capture a more holistic view of the intended users. In their new context, design, these methods give companies and design teams the opportunity to understand what users cannot verbally articulate.[21] Professionals coming from social science background have taken the lead in these early user research and idea generation activities.[22] Although we've seen major developments in the user research field, qualitative user research conducted by specially trained design researchers before development of products and services still is not the worldwide convention.[23] The number of companies and design offices in which designers and design researchers collaborate in the process is limited.

In the absence of trained design researchers, designers try to undertake the role as user advocates[24] and apply ad-hoc research methods. However, this task is not an easy one because "'design' and 'use' are often separated in time and space as well as being undertaken by different people with different skills, concerns, and in different sets of constraints."[25] Even though "designers often think of themselves as typical users,"[26] they are challenged to truly represent the actual end-users because of demographic, educational, and socio-cultural differences. As a result, "designers need to employ a variety of methods … to deal with user groups outside their own experience."[27]

Within this context, the relationship between the designers and the user gains in significance. Scholars have considered the designer-user relationship in the socio-cultural context and look to communication literature for models to enhance the design of user experiences. The writer-reader model of communication through objects is one that demonstrates the designer-user relationship. Also called the sender-message-receiver model,[28] this communication process is carried out by single-directional messages transmitted by artifacts as the medium. The designer is on the source end of the communication, and the user is on the destination end.[29] This separation has a tendency to exclude user input in the design process and treats users as passive receivers of products and services.[30] The designer is responsible for successfully conveying any message through the design of the artifact.

12 "ID Defined," *Industrial Designers Society of America*, n.d., http://www.idsa.org/ content/id-defined (accessed March 10, 2010).

13 Christina Wasson, "Ethnography in the Field of Design," *Human Organization* 59, no. 4 (2000): 377–388.

14 Paul Rothstein, "The "Re-emergence" of Ethnography in Industrial Design Today," paper presented at the *Design Education Conference* (Chicago, IL, 1999).

15 Elizabeth Sanders, "Design Research in 2006," *Design Research Quarterly* 1, no. 1 (2006): 1–8.

16 Wasson, "Ethnography in the Field of Design."

17 William Reese, "Behavioral Scientists Enter Design: Seven Critical Histories," in *Creating Breakthrough Ideas: the Collaboration of Anthropologists and Designers in the Product Development Industry*, ed. Susan Squires and Bryan Byrne (Westport, CT: Bergin & Garvey, 2002), 17–43.

18 Cal Swann, "Action Research and the Practice of Design," *Design Issues* 18:1 (Winter 2002): 49–61.

19 William W. Gaver et al., "Cultural Probes and the Value of Uncertainty," *Interactions* 11, no. 5 (2004): 53–56.

20 Wasson, "Ethnography in the field of design."

21 Dorothy Leonard and Jeffrey F. Rayport, "Spark Innovation Through Empathic Design," *Harvard Business Review* 75, no. 6 (1997): 102–113.

22 Sanders, "Design research in 2006."

23 Hummels, Redström, and Koskinen, "Design Research for Social Scientists."

24 Klaus Krippendorff, *The Semantic Turn: a New Foundation for Design* (Boca Raton: CRC Press, 2005).

25 Alex Voss et al., "Design as and for collaboration: making sense of and supporting practical action," in *Configuring user-designer relations*, ed. Alex Voss et al. (London: Springer, 2009), 32.

26 Donald A. Norman, *The Design of Everyday Things* (New York: Basic Books, 2002), 155.

27 Deana McDonagh-Philp and Cherie Lebbon, "The Emotional Domain in Product Design," *The Design Journal* 3, no. 1 (2000): 35.

In contrast, using newer communication models, designers try to enter the experience space of users. Based on Schramm's communication model, Crilly et al. posit "communication is only possible where the message resides in the areas of overlap between experiences."[31] In this sense, designers are entering into users' experience space, building empathy with the users and trying to experience the world from the eye of the intended user groups.

In current design research literature, the studies on users that refer to entering the experience space are mostly limited to the fuzzy-front-end of design.[32] In other words, the designer-user relationship is thought to have the biggest effect on the problem space of design. The knowledge gained from user experiences helps designers analyze and reanalyze the design problem, making ill-defined design problems more tangible.[33] However, we do not have enough studies on how these changes in the early stages of design are affecting the subsequent design phases or the final user response to an artifact.

In addition, current design literature lacks in-depth analyses on the associations between user research and the bigger design process.[34] One of the general assumptions is that, with the incorporation of empirical research into the *design problem space*, the success of the artifacts will be granted in the *design solution space*. While "the problem space and the solution space co-evolve together, with interchange of information between the two spaces,"[35] the effect of various user research methods on these spaces has not yet been fully studied. Although a wide variety of research methods are available from which to select while conducting research on users,[36,37] the unique effects of each method or set of methods on the problem and solution spaces are not clear.[38] We also do not know how the process and the outcome are affected by the one who is conducting the research (e.g., designers or trained design researchers). Current literature and practice highlight three points: 1) the significance of learning from user experiences, 2) the importance of creating a relationship between designers and users, and 3) the necessity of having more empirical studies on the unique effect of each research tool on the design process and the end-user experience.

Research: An Analysis in the Turkish Context

This paper reports and interprets data collected in 2006 in Turkey[39] seeking to answer these two key questions:

What methods are used by Turkish industrial designers to create a relationship with users?

How do these methods affect the end-user experiences?

Research Context

Industrial design in Turkey does not have a long history as a profession.[40, 41] Design education in the country was initiated by the West as part of aid programs (e.g., the Marshall Plan) in the 1950s. However, an industrial demand for graduates did not develop until

28 Nathan Crilly et al., "Design as Communication: Exploring the Validity and Utility of Relating Intention to Interpretation," *Design Studies* 29, no. 5 (2008): 425–457.

29 Nathan Crilly, James Moultrie, and P. John Clarkson, "Seeing Things: Consumer Response to the Visual Domain in Product Design," *Design Studies* 25, no. 6 (2004): 547–577.

30 Crilly et al., "Design as Communication."

31 Ibid., 432.

32 Rhea, "Bringing Clarity to the "Fuzzy Front end."

33 Ibid.

34 Jay Melican, "User Studies: Finding a Place in Design Practice and Education," *Visible Language* 38, no. 2 (2004): 168–193.

35 Kees Dorst and Nigel Cross, "Creativity in the Design Process: Co-evolution of Problem–solution," *Design Studies* 22, no. 5 (2001): 434.

36 Sanders, "Design Research in 2006."

37 "Institute of Design Methods Poster," *Institute of Design, Illinois Institute of Technology*, http://trex.id.iit.edu/news/idiom/030907/idmethods_poster.pdf (accessed February 22, 2010).

38 Simo Sade, "Towards User-centred Design: a Method Development Project in a Product Design Consultancy," *The Design Journal* 4, no. 3 (2001): 20–32.

39 Data was collected for a M.Sc. thesis under the supervision of Professor H. Alpay Er in the Graduate Program of Industrial Product Design at Istanbul Techical University. Isil Oygur, "Investigating Industrial Designer-user Relationship in the Turkish Context" (M.Sc. Thesis, Istanbul Technical University, 2006).

40 H. Alpay Er, "A Creative Convergence of Modernity, Globalization and Tradition: Understanding Industrial Design in Turkey," *Asia Design Journal* 4, no. 4 (2009): 68–89.

41 A. Can Özcan, "An Overview of the Early Foundations and Development of Contemporary Industrial Design in Turkey," *The Design Journal* 12, no. 3 (2009): 267–287.

the late twentieth century, when national brands turned to exports and needed support from industrial design to differentiate their products in the global market.[42,43]

The twenty-first century brings rapid developments in every area of design. Turkish industrial designers take part in international fairs and are awarded international prizes.[44] The number of universities offering industrial design programs is increasing.[45] Products designed, developed, and manufactured in the country are gaining international acknowledgements.[46] The West continues as the main model. The Turkish design community, without self-evaluation or necessary transformations, has followed the "design development pattern of the West."[47] The practice of user research is no exception.[48]

The number of research firms and institutions specific to user research is still very limited in Turkey. Academic research units lead current efforts. Studies by these institutions are generally limited to usability problems, human-computer interaction, ergonomic issues, and experimental investigations.[49]

Thus, industrial designers themselves conduct research to gain insight from users. This research is voluntary because clients, who are not yet familiar with the benefits of user research, generally do not require it. Instead, Turkish companies generally rely on traditional market research to understand users.

Research Design

The design of this study was embedded multiple-case studies as described by Yin.[50] Eight products designed, developed, and manufactured by Turkish designers, engineers, and companies were selected as cases. The Industrial Designers Society of Turkey, the only national organization for industrial designers in the country, published seven of the eight products in a catalog.[51] This catalog included products that were nominated for an exhibition based on their market success.

The products for this study were selected based on their cultural significance. A criterion of the study was that equal numbers of culturally significant products and universal products were included. The eighth product in the study, a tea maker, was not selected from this product catalog. Instead, it was selected for its uniqueness; the first version of this product was the first local alternative of its kind.

The research was designed with three phases of information gathering: one from designers, one from firms, and one from users (see Table 1). For each case, the process started with a designer interview based on 10 open-ended questions.[52] Designer interviews were followed by a structured interview with a representative from the marketing department of the manufacturing firm.[53] The final step involved user questionnaires that included open-ended and multiple-choice questions. The sampling strategies for users were

42 H. Alpay Er, Fatma Korkut, and Özlem Er, "U.S. Involvement in the Development of Design in the Periphery: the Case History of Industrial Design Education in Turkey, 1950s–1970s," *Design Issues* 19:2 (2003): 17–34.

43 H. Alpay Er, "A Creative Convergence of Modernity, Globalization and Tradition: Understanding Industrial Design in Turkey."

44 Ibid.

45 Özcan, "An Overview of the Early Foundations and Development of Contemporary Industrial Design In Turkey."

46 Ibid.

47 Tevfik Balcıoğlu, "A Glance at Design Discourse in Turkey," *The Design Journal* 12, no. 4 (2009): 263–266.

48 Isil Oygur, "Designing for Turkish Users: Analyzing the Industrial Designer – User Relationship in Turkey," in *EPIC2009: Ethnographic Praxis in Industry Conferece Proceedings* (presented at the EPIC2009: Ethnographic Praxis in Industry Conferece, Chicago, IL, 2009), 243–260.

49 UTEST Product Usability Unit at Middle East Technical University (www.utest.metu.edu.tr) and the Communication Design Department at Yildiz Technical University (www.ilet.yildiz.edu.tr) are two of the most active organizations in the field. Both of these units serve as educational entities and research labs for the private sector.

50 Robert K. Yin, *Case Study Research: Design and Methods*, 4th ed. (Thousand Oaks, CA: Sage Publications, 2008).

51 *2000'li yıllarda rekabette tasarım ile fark yaratanlar özel sergisi sergi kataloğu (The catalog of making difference with design in the 2000's exhibition)* (Istanbul: Turkey, 2005).

52 For each case, there was a larger design team in charge. The designers interviewed were the team leaders of each project.

53 The data collected from firms are not included in this paper because the subject of this paper is limited to the designer-user relationship.

Table 1. Overview of Cases (images reproduced by permission of the designers; a version of the table was published in the Ethnographic Praxis in Industry Conference Proceedings, Chicago, IL, 2009)

				
Product category	**Cash register**	**Juice bottle**	**Raki bottle**	**Steam generator iron**
Designer	Designer A	Designer B	Designer C1 and C2	Designer D
Firm	Firm A	Firm B	Firm C	Firm D / Firm E*
User research firm	-	-	-	-
Number of users	10	20	14	5
Designed in	2004	2000	2005	2004
				
Product category	**Tea maker**	**Turkish coffee maker**	**Turkish coffee pot**	**Washbasin**
Designer	Designer D	Designer E	Designer F	Designer G
Firm	Firm D / Firm E*	Firm D	Firm F	Firm G
User research firm	-	U-firm	-	-
Number of users	20	19	9	7
Designed in	2001	2004	2005	2004

* Firm E is an original equipment manufacturer (OEM)

convenience and snowball sampling. In total, 8 industrial designers, 7 firm representatives, 1 user research firm representative, and 104 users participated in the study.

Research methods were tested through a pilot study, and necessary changes were made. Importantly, the pilot study showed that questionnaires accompanied with in-situ observations of users interacting with the products resulted in more holistic data.

Products

Four of the eight products have a cultural significance in Turkey. These products are a raki bottle, a tea maker, a Turkish coffee maker, and a Turkish coffee pot. The rest of the products have more universal meanings and functions. All the products target the local market.[54]

The *cash register* was developed for small-sized businesses to provide a low-cost alternative. The main design criteria, established by designers, were a small body to occupy less space, ultraviolet lights for counterfeit money detection, removable key covers for labeling, and a simple interface with fewer functions.

The *juice bottle* was designed for the first non-concentrated juice in Turkey. To make the juice more visible, glass was selected as the material. Haptic issues and the designer's prediction that the bottles would be reused after the consumption of the juice influenced the shape to the bottle.

The *raki bottle* was designed for Turkey's traditional alcoholic drink, which is called raki. Although both females and males consume it, raki is deemed a masculine drink. While redesigning the bottle, designers aimed at developing a symbolic form. The inspiration behind the form was the "combination of simplicity of the West with the orientalism of the East" (Designer C1).

54 More detailed information on six of the cases is available in Oygur, "Designing for Turkish users."

The *steam generator iron* was designed to be a semi-professional iron for domestic use. It is the first local brand alternative for this product category. This form is designed for easy use with a wider water container for more steam and was inspired by earlier iron designs.

The *tea maker* was designed to simulate the traditional process of brewing tea using electricity as the energy source. This tea maker is made of steel, the most common traditional teapot material, because it is believed to be healthier. This material choice makes the tea maker a little more expensive than it would have been using other material alternatives. The product targets users who can afford to pay more for style.

The *Turkish coffee maker* is the first coffee machine specifically developed for Turkish coffee. This machine imitates the traditional coffee brewing process. Although the main targets were small and medium-sized enterprises, the product also is found in homes. Among the products studied, this is the only one that included a user research consultancy for conducting qualitative user studies.

The *Turkish coffee pot* is different from the Turkish coffee maker in the sense that it is not fully automated. This product resembles the traditional Turkish coffee pots in terms of both form and the coffee making ritual. Its basic difference is that it is electric instead of brewing the coffee on the stove.

The *washbasin* was designed to fill a gap in the local niche market. The goal was to develop a "designer washbasin." Only a very limited selection of designer washbasins were available from local manufacturers. The basin is designed to be used with wall-mounted taps, and its form is associated with Zen Buddhism and Japanese temples.

Designers

All the designers who participated in this study have a background in industrial design (see Table 2). The professional experience of this group ranges from 6 to 29 years; 14.4 years is the mean.

Each design office had 4 to 15 employees at the time of the study. Designer D designed the tea maker while he was working as an in-house designer for the Firm D. When the study was conducted, this designer had launched his own design office and provided consultancy services for a wide range of firms. He designed the steam generator iron during this period.

Users

Among the 104 users who participated in the study, 51.9% were female and 48.1% were male. This population lived in nine Turkish cities, mostly in Istanbul, Ankara, and Antalya. The ages ranged from less than 20 to more than 70, with the largest population in the 25- to 30-year range. The users were diverse in terms of their educational background. Around 20% of the users had a high school degree or less as their highest degree.

Table 2. Designers' profile

	Designer A	**Designer B**	**Designer C1**	**Designer C2**
Highest degree	Bachelor's	Doctorate	Master's	Master's
Female/Male	Male	Female	Female	Male
Location	Istanbul	Istanbul	Istanbul	Istanbul
In-house/Freelance	Freelance	Freelance	Freelance	Freelance
Position	Principal	Principal	Principal	Senior-designer
	Designer D	**Designer E**	**Designer F**	**Designer G**
Highest degree	Bachelor's	Bachelor's	Bachelor's	Bachelor's
Female/Male	Male	Male	Male	Male
Location	Istanbul	Istanbul	Istanbul	Istanbul
In-house/Freelance	Freelance	In-house	Freelance	Freelance
Position	Principal	Senior-designer	Principal	Principal

Findings: Designers' Perspective

Who is the user? All designers described the user as important in affecting design. However, none of the designers provided a differentiation between user profiles for the different products they designed. When asked to define the users, the designers responded with "everyone," mentioning Turkish citizens in general. Each designer thus seems to have a mental model for a generic user. Regardless of the product to be designed, they imagine the same person. They simply change the tasks that model person is performing.

Table 3. Research methods used in the design of each product

	Intuition	Internet Search	International Magazines/ Fairs	Personal Design Experience with the Product Category	Professional Experience with the Product Category	Market Research Data Provided by Firms	Interviews	Observations	Participatory Observations	Field Research	Focus Groups	Usability Tests
Cash Register	•		•			•		•		•		•
Juice Register	•		•	•	•							
Raki Bottle	•	•		0		•		•			•	
Steam Generator Iron	•			•	•			•				
Tea Maker	•			•	•							
Turkish Coffee Maker				0		•	•	•	•	•	•	•
Turkish Coffee Pot	•	•	•	•		•		•				
Washbasin	•	•	•	•		•						

0 - refers to limited experience with the category

Designers' user research methods: Although all designers in this study believe that user input is important in design development, they do not find it crucial for every design project. The need for user input is influenced by product category, product function, length of the design project, the client, and the designer's personal and professional experience with the product category. In fact, designers identified 13 research methods used in the design of the 8 products in this study (Table 3). Intuition and personal experience with the product were the two methods on which the group most relied.

Designers believe that, because of their skills and education, they intuitively understand users' desires, needs, and expectations. They also claim that their profession requires them to "conduct life-long research" (Designer B); therefore, they do not see a need to conduct research for each project. Designer D described it this way: "I have been trying to be user-centered for the last 20 years." For this reason, following trends from magazines and international fairs was thought to be sufficient for some design projects (Designer B; Designer D; Designer F; Designer G).

All of the designers, except Designer A, described previous interactions with the products prior to the related design project. When designers do not have knowledge or experience with a product, they try to build this knowledge, experimenting with the product themselves. For example, although Designers C1 and C2 are familiar with raki, they are not raki drinkers. They observed people to gain a better understanding of raki drinking rituals. On the other hand, Designer G appreciates natural resources and finds water to be calming. He is also familiar with Buddhism and Zen. Thus, in the design of the washbasin, he combined his preferences with his life-long experience with washbasins to create the final design.

Many designers reported user observation as the strongest tool for gathering user information and preferred it over methods such as questionnaires, interviews, or focus groups. Except for the design of the Turkish coffee maker, the observations conducted by designers were informal and without any systematic basis. Designer D explained the significance of observations for the steam generator iron: "Irons are for labor and users do not question their ergonomic qualities. But, when a designer observes someone ironing, users' need to bend in order to see the front end of the iron can immediately be realized. Only observation can reveal this knowledge."

The design of the cash register involved user observations carried out by the project designers. The team started the design process with field research. They took photographs, observed users' interactions with similar products, and analyzed the work context. This initial research phase helped the design team to define tangible issues related to cash registers. They did not interview users to probe the less tangible issues: "Our wish is to concentrate more on user dreams. We do not have any information related to that part right

now. Instead, our knowledge is more on the problem parameters side, such as the counter is 80 cm, the device should be smaller than 25 cm." The final design combined solutions for predefined problems seen in the field with the intuitive knowledge of designers related to form and users.

Systematic user research conducted by a consulting firm contributed to the design of the Turkish coffee maker. The main aim of the research was to understand why drinkers did not like Turkish coffee prepared by the coffee machines available on the market, and to identify the qualities of a machine that they would like. One of the early findings was that users do not like the taste of Turkish coffee prepared by espresso-type machines. Turkish coffee needs to be brewed from the bottom. This clue helped Firm D's research and development department to develop a mechanism that mimics the process of traditional Turkish coffee preparation; the ethnographic studies in homes and in small- to medium-sized businesses, together with focus group studies, helped the design team develop the machine's form. From time to time, users also evaluated product sketches in focus group studies.

In the design of the raki bottle, focus group studies were conducted after initial design decisions were made. Focus group studies were used to select the bottle from several design alternatives. The designers of the selected bottle depended primarily on their intuition and on observations of people around them to inform the design process. Although they were not raki drinkers, because they grew up in Turkey, they were familiar with the raki culture.

In general, designers did not believe in the value of market research data. Designer B and Designer F specifically talked about experiences with misleading information provided to them in their professional career. Market research data was mostly referred to for specifying the price range of the product to be developed (Designer A). The designers criticized corporate strategies that focus predominantly on price competition rather than innovation.

Finally, the designers offered two reasons for a general distrust of the end user as an authority in the design of a product. First, Turkey is a country of multiple identities and cultures; representing this diversity through user research is a daunting task. Second, designers generally view the consumers as being ignorant and don't trust their responses. This leads to the final observation of the egocentric nature of design: designers criticized themselves and their peers for creating form-centric products that were in keeping with the designer's own education, training, and personal aesthetic.

Who should be conducting user research? There were conflicts among designers on who needs to be conducting user research. Designers B, C1, and F were advocates of having the manufacturing firms do the user research and provide the results to designers. These designers

55 Designers D, E, and G learned contextual inquiry, interviews, ethnography, and brainstorming from the well-known design firm, IDEO. While these designers were working for Firm D, Firm D contracted with IDEO to teach its design process to the firm's in-house design team. IDEO might have provided these designers with a different perspective on user research, and this perspective might have been the reason for their being stronger advocates of conducting user research.

56 The dynamics behind this dissatisfaction were not limited to the design of the product. Users cited poor customer service and the software for the product as additional complaints.

Figure 1
Cash Register Coupled with a Separate Counterfeit Detector (as of the Ethnographic Praxis in Industry Conference Proceedings, Chicago, IL, 2009)

Figure 2.
Washbasin in Use with Countertop Taps (as of the Ethnographic Praxis in Industry Conference Proceedings, Chicago, IL, 2009)

stated that they were not trained for doing systematic user research. Designers A, C2, D, E, and G[55] defended conducting research themselves or doing it together with specially trained researchers:

> We are living in a three dimensional world and designing three dimensional products. The interaction between the products and the users, the products with other products, and the products with the context is important… Market research data and the photographs handed to me are not as valuable as me experiencing it. (Designer G).

Designers believe in the positive value of observing users, but they recognize that they are not well equipped in research. At this point, design education was criticized for not providing the necessary knowledge in this area. They stated that design education concentrates mostly on the importance of the user as a design factor without educating students in rigorous user research methods.

Findings: Users' Perspective

When users were asked to define their experience with the products in this study, all were initially positive. However, frustrations were revealed in response to more focused questions. These were mostly related to the usability of the products. For instance, users did not fully use most of the functions added by designers to the cash register: 75% of the users were unhappy with their decision to buy this cash register.[56] Even though the cash register was targeted for use in small spaces, users stated concerns related to its size. Although the cash register itself is small, the drawers accompanying the product are bigger than the device. As a result, the cash register still occupies a bigger space than intended by the designers (see Figure 1). The users were also critical of the counterfeit detectors, criticizing the placement of the ultraviolet LEDs and their intensity.

In the case of the fresh juice bottle, the goal to promote brand loyalty through a unique glass bottle did not meet expectations. Users of this product were not as loyal to it as predicted. Instead, they bought the product occasionally and reused the bottle after drinking the juice inside. They used the bottles for storing water, other fresh juices, flowers, laundry softener, and spices. When asked about this, users responded that they didn't like to discard a glass bottle.

In the case of the raki bottle, the design intention also was not met. Instead of representing a masculine unification of East and West, users interpreted the form of the bottle to be feminine. They commented that it feels as if they are grasping a woman's waist while holding the bottle. The users did not see this as a problem; they are more interested in the quality of the drink than the design of the bottle.

Interviewed users found the washbasin to be aesthetically pleasing, but they also reported problems. When installed with countertop taps, the space was not adequate for use, causing water to splash beyond the basin (see Figure 2). This led to frustrations for the users. Also, the washbasin was found in places other than the designer's vision, such as an arabesque nightclub.

Discussion

When comparing the designers' perspectives shared among each other with the users' perspectives, several points stand out. None of the designers in this study saw a need to conduct user research if they had either personal experience with the product as a user or professional experience with the product category as a designer. In these cases, they relied on previous knowledge, together with an intuitive approach, to generate solutions. However, these solutions did not always meet the project goals or satisfy the users.

Table 4. Distribution of research methods by problem and solution spaces of design

	Problem Space										Solution Space		
	Internet search	International magazines/ fairs	Market Research Data Provided by Firms	Interviews	Observations	Questionnaires	Participatory Observations	Field Research	Focus Groups	Usability Tests	Intuition	Personal Experience with the Product category	Professional Design Experience with the Product Category
Cash Register		•	•		•			•		•	•		
Juice Register		•									•	•	•
Raki Bottle	•		•		•				•		•	0	
Steam Generator Iron					•						•	•	•
Tea Maker											•	•	•
Turkish Coffee Maker			•	•	•		•	•	•	•		0	
Turkish Coffee Pot	•	•			•						•	•	
Washbasin	•	•	•			•					•	•	

0 - refers to limited experience with the category

Table 4 illustrates the regrouping of the user research methods based on their dominance in the problem and solution spaces of design. Systematic or ad hoc user research methods are more often applied in the problem space of design, whereas intuition and personal and professional experience with the product category are dominant in the solution space. Thus, whenever designers are equipped with intuitive and experience-based knowledge, they skip the user research phase and problem definition to start the design process immediately. This process is exemplified in the cases of the juice bottle, steam generator iron, and tea maker.

When designers subscribe to user research using ad hoc methods, these methods do not always guarantee a successful design solution. In the case of the cash register, designers conducted research in the field, but it was not systematic. Designers observed small shop owners' activities and cash transactions. Nevertheless, users were generally dissatisfied with the final product. In this case, designers had implemented design solutions for problems they

57 See, for example, Andrew Roberts, "Cognitive Styles and Student Progression in Architectural Design Education," *Design Studies* 27, no. 2 (2006): 167–181.

58 See, for example, Jon R. Katzenbach and Douglas K. Smith, *The Wisdom of Teams: Creating the High-performance Organization* (New York: Harper Paperbacks, 2003).

59 Susan Squires and Bryan Byrne, eds., *Creating Breakthrough Ideas: the Collaboration of Anthropologists and Designers in the Product Development Industry* (Westport, CT: Bergin & Garvey, 2002).

60 John F. Sherry, ed., *Contemporary Marketing and Consumer Behavior: an Anthropological Sourcebook* (Thousand Oaks, CA: Sage Publications, 1995).

perceived through observations, without using in-depth personal or professional experience with the product category. The lack of experience-based knowledge might have been the reason for unsatisfactory design solutions. The cash register was the only case in the study that did not involve designers' personal experience with the product as a user, and this product was associated with higher levels of user frustration.

Another case that involved designers' limited experience with the product is the Turkish coffee maker. In this case, trained researchers engaged in systematic user research, and designers applied the findings in the solution space. The coffee maker was acknowledged as successful by the users. For this case, the systematic user research methods could have played a significant role affecting the solution space. We can infer that, in the absence of enough personal and professional experience with the product, systematic user research with trained researchers can fill the gap. However, this does not always hold true for ad hoc research methods. Designers of the raki bottle also had limited experience with the product. They conducted observations themselves, but the form of the end product communicated a different meaning than designers' intention.

Turkish designers depend on a personal aesthetic in the design of products. In all cases when aesthetics were emphasized, the forms were generally well received by the end users, even if the function of the product was not successful.

The conversations on user-centered design strategies in this study were limited to the research and idea generation phases of the design process. None of the designers provided information related to transformations in other phases of the design process as a result of user-centered design approaches or user research. This study renders user-centered design as a shallow and superficial strategy that is incapable of penetrating all phases of the design process in the Turkish context.

Conclusions and Implications for Further Research

Most subject matters related to design disciplines overlap with the areas of expertise of other professions. Cognitive studies in design are informed by psychology;[57] research on collaborative design uses literature from organizational studies in business.[58] Similarly, studies on user research are mostly informed by research conducted in anthropology, sociology, psychology, and marketing.[59,60] Design disciplines need more in-depth disciplinary studies on user research, user-centered design, and research-inspired design processes. This study aimed at a disciplinary analysis of the effect of user research methods on the design process and on the end-user experiences. Rather than offering definitive conclusions, the findings mostly suggest further areas of study.

Design in Turkey is in a transition period from a writer-reader model of designer-user relationship to a more experiential

one. Comparative analysis of the eight cases revealed the significance of three research methods on the solution space of design: intuition, designers' personal experience as a user, and designers' professional experience with the product category. User research methods introduced by social scientist and user-centered design approaches were found to be more effective in the problem space of design, which corresponds to data collection and idea generation phases. In the absence of intuitive and experience-based knowledge, systematic user research fills the gap and helps designers develop successful design solutions. However, ad hoc research conducted by untrained designers does not have the same effect on the solution space of design.

In drawing these conclusions, it is important to note their shortcomings. The findings of this study did not reveal much information on the unique input of each research method to the design process. For example, for the cash register, the absence of interviews, questionnaires, participatory observations, and focus groups might have played a role in the dissatisfaction experienced by end users. Furthermore, the current study concentrated on the industrial design practice in Turkey. There might be contextual issues in play that prevent us from generalizing. It is necessary to compare the results of this research with studies from other contexts for generalizable conclusions.

The knowledge gained from this research inspired two further research questions. The first, related to contextual differences, indicates that there are not enough studies explaining the effect of context on user research and user research methods. This study reveals insights on the difficulty of applying Western-oriented user research methods in the Turkish context because of the cultural diversity in the country (U-firm). Different localities call for unique transformation in user research methods. Further research studying the contextual transformations on user research will generate theoretical and practical knowledge about contextual differentiations.

Second, design disciplines need guidelines to help design teams decide when to conduct systematic user research, which research methods to apply, and how much time to devote on research. The Turkish case shows that factors such as product category and prior experience of designers play a significant role in making these decisions. However, this study provides a limited perspective that needs to be investigated further.

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