Co-Design Practice in Industrial Design Education in Turkey: A Participatory Design Project

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Abstract

The evolution in design research has shifted from a user-centered design approach to co-design approach. With co-designing, roles of designers and users have changed. In growing co-creation and co-design notions, user is seen as a partner, not as a passive object of study. In current undergraduate industrial design education in Turkey, user research is done in limited steps during design process. User observations that are required for students during their design processes are done outside of studio courses with the students’ own opportunities. Yet students face difficulties in design process of the products especially the ones they have not experienced before. This study aims to apply ‘designing with users’ notion instead of ‘designing for users’ into a practice in education field. The goals of this study are; to benefit from users who are experts of their experiences as teammates during the design process and to satisfy user’s expectations with the end product by using an alternative approach in design education. Two design projects were conducted with 12 third-year industrial design students from Gazi University and six volunteer users in 302 Industrial Design course. Three groups, each consisting of six (four students and two users), were formed to design products according to project briefs. Users participated in the problem definition and idea generation sessions as co-designers during design process. A questionnaire and interviews were used to collect data about students’ remarks on participation of users. Students evaluated what they learned from co-designing and how users contributed to design process. The results of the surveys reflect that efficiency of design process can be improved with participation and collaboration of users. Users can play large roles from idea generation to concept development. Consequently, it was observed that co-designing can be efficiently implemented into undergraduate industrial design education.

Keywords: design education; design process; co-design; participatory design; user research

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1. Introduction

Participatory design, collective design, collaborative design, co-design notions are increasing due to the interdisciplinary nature of design. Each of these approaches is a part of the greater whole of human-centered design.

One of the major problems in traditional industrial design education in Turkey is that user research required for design process is disregarded by students. Moreover, students remain insufficient at building the product usage scenario and the user-product relationship of the products that they have not experienced as users. In order to solve these problems collaborative design methods could be followed. Thus, the shift from individual to team in design thinking could be applied in design education.

The main objective of this study is to apply ‘designing with users’ notion instead of ‘designing for users’ into a practice in education field (Sanders, 2002). This paper looks at the potential for the application of co-design methods within an educational framework. The purpose of this study is to find out the effects and the benefits of user participation in undergraduate industrial design education where product design students and experienced users can work collaboratively during design process. This study explains how volunteer users, who are not trained in design but are experts of their experiences, participated in product designing equipment bag for hiking. Furthermore, how much influence the active involvement of these expert users had on students’ design solutions.

In this study participatory design term is used for not only user participation based on testing and evaluating but also a direct and an active user involvement in problem definition and idea generation phases of the design process.

1.1. Literature Review

It is acknowledged that designers should know a little bit about everything in order to design. However, design activity requires varied knowledge from varied point of views.

Participatory design is fundamentally rooted in early Greek Civilization, “where perhaps the first formal citizen forums were held” (Beheshti, 1986). Including the perspectives of users in a system design project was initiated in Scandinavia in the 1970s and became widespread by the 1990s. In Norway, Sweden and Denmark, the “Collective Resource Approach”, was one of the first participatory design projects, established to increase the value of industrial production where union workers were actively engaged in the development of new systems designed to make their workplaces more efficient (Sanders and Stappers, 2008). The approach put together the expertise of the system researchers and the workers (Bødker, 1996). Participatory design does not just ask users opinions on design issues, but actively involves them in the design and decision-making processes.

Co-design can be thought as a modern version of participatory design (Steen, 2011). Co-design can be described as “any act of collective creativity that is shared by two or more people” (Sanders and Stappers, 2008). In co-design it is believed that everyone can be creative, therefore users can play important roles in design processes (Sanders, 2002). In co-creation and co-design processes the roles of designers and the users who are not trained in design field become mixed. In co-design users can become part of a design team as ‘expert of their experiences’ (Sleeswijk Visser et al., 2005). Co-creativity, co-creation and co-design notions believe that every single person is creative and can be expert of his/her experiences. Everyone even nondesigners can be creative when the topic is about experiences they care about like their hobbies (Sanders, 2001). Design practice has also been influenced by the changing landscape of human-centered design education.

2. A Co-Design Practice

For this research two design projects were conducted in 301 Industrial Design course at Gazi University, Department of Industrial Design. There were 12 industrial design students, four users from Mountaineering Society and two users from Cycling Team of Gazi University who contributed to the study in the fall semester of 2014-2015.

The participants worked in three design teams. The teams were formed to design products according to the project briefs. First project was designing a wearable lighting for an outdoor sport (cycling, hiking and mountain climbing sports) without user participation. Each group consisted of four design students. First group developed a wearable lighting for cycling, second group developed a wearable lighting for hiking and the third group developed a wearable lighting for mountain climbing. Second project was designing an equipment bag for cycling, hiking and
mountain climbing sports. Each team consisted of four students and two intended users who have specific knowledge, skills and expertise on the topic. The users participated in the problem definition and idea generation sessions during. Each team was responsible for developing a product for their sports.

Within the context of this study, design process of the projects follows three main steps:

- Problem definition session (one week): Exploring the problems related with product during usage
- Idea generation session (one week): Generating concepts
- Design detailing & finalizing session (one week): Developing the concept into a detailed design solution

Since the students did not use and experience the products of outdoor sports, the products for outdoor sports were chosen as projects. The reason for carrying out two design projects; one of them is traditional design process without user participation and the other is co-design process with user participation, is to give a better chance to the students for comparing these two processes and understanding the difference between them easily. Since the hiking team’s process and final product are considered most successful among those three groups according to the grades given by the jury, in this paper hiking team is used as an example.

2.1. Wearable Lighting for Hiking

The wearable lighting for hiking took place at Department of Industrial Design in the third-year product design studio course. For the first project three groups, each consisting of four industrial design students were formed. One of the teams was supposed to design wearable lighting product for hiking, considering the problems and the needs of this sport.

At the beginning of the project students presented their detailed research results on hiking sport and the lighting products that are used in hiking. After the research presentation, a brainstorming session was held on the usage scenario of the product and the problems related to it.

In idea generation phase each student was given the task to create 10 sketches of their initial ideas. For the next step, in sketch exercise they combined the ideas they individually produced before. In this way they improved each other’s ideas. Later the team selected four of the product solutions that they developed earlier and then detailed them. At the end of the idea generation phases, these four product solutions were evaluated by the professors of the studio course. In the direction of the critiques, team selected the most promising concept and spent the last week for finalizing the project’s concept.

2.2. Equipment Bag for Hiking

Within the scope of this study co-design approach is integrated into the problem definition and idea generation phases of an educational design project. As the first project, second project also had same duration and phases. On the other hand this time team consisted of six members (four industrial design student and two users). The participants of the study volunteered for attending the sessions. At the beginning of the project, students were informed about the terms such as; user centered design, human centered design, participatory design and co-design and the co-creation process of the project.

The following section explains the implementation of co-design practice into the education field and explores how users can be effectively involved in design process.

First of all, design students and users introduced themselves. At the start of the session students were given the project brief of equipment bag for hiking and the project content was explained to them. The participants of the study who volunteered for this project told hiking scenarios and shared their previous experiences. The users were asked about not only their needs and desires but also the things that they do not want. By analyzing existing equipment bags that are used by the users, the users told the problems related to the products thus design students gained knowledge on hiking equipment and hiking bags. In the four hour task the students developed concepts for hiking bag. Four sessions were held in the first two weeks of the project. The students and the users were together
During the first two weeks. Last week, at the final stage design students detailed and finalized product solutions. Afterwards a jury consisted of both instructors and users evaluated and graded the final design of the project proposed by the co-design team.

Users attended four face to face meetings and interactive sessions in two weeks. Due to the facts that participants are both students and belong to same age group, they communicate well and easily with each other. Using think aloud technique participants clearly expressed their thoughts. Design activity between the students and the users are both verbal and visual.

Fig. 1. 3D modellings of the hiking bag designed by co-design team.

3. Findings

This research was primarily based on documents from the questionnaires and the interviews with the students. The co-designing sessions were observed, the design students filled out a questionnaire and they were interviewed about what they experienced in co-design process. This study aimed to investigate users’ contributions to a participatory design process.

What are the contributions from users to the participatory design process?

The observations show that users’ contributions to the final product are mostly functional considerations. The solutions that are suggested by users are mostly related with the functional properties of the bag. The reason for this is in outdoor sports; form follows function.

How do users’ ideas appear in the final product design?

In addition to the ideas, users’ critical feedback had effects on design decisions; the students accepted the users’ opinions as absolute truth and included them directly in their design solutions. Users’ novel ideas, for example; (1) a mat part at the bottom of the bag in order to sit on it and take a short rest without taking off the bag throughout hiking, and (2) an extra thermal pocket for preserving the temperature of water and protein-based food for longer time, appeared clearly in the final product design. However, students could not develop and finalize all ideas proposed by the users. Hence, some ideas related to product’s physical properties could not be occurred in final design.

For students it was difficult to satisfy users while trying to find optimal design solutions for the functions determined by user needs.

3.1. Questionnaire Results of Students

To explore the awareness of the design students on the co-design approach, a small survey with both open-ended and close-ended questions were prepared and asked 12 industrial design students in the form of a questionnaire after the first project which is done with traditional methods. The open-ended questions prepared for the mini-survey are as follows:

- Have you heard about the terms co-design or participatory design before? If yes, from which source(s)? 6 out of 12 students answered “Yes, I have heard about it but not in detail from my other theoretical courses”. On the other hand, 6 out of 12 students have heard them for the first time.
- Do you have any experiences in one of those outdoor sports (cycling or hiking or mountaineering)
The students were asked the type of user research they have done for the first project. Since lighting for hiking was not suitable for user observation and they could not reach the real users one-to-one, they tried to reach users via internet and made an user survey through web-based forums. They also visited outdoor sport stores and examined the most preferred products and brands in stores by asking some technical details to dealers.

As seen in Table 1, they indicated in the questionnaire that they all needed user experience during design process, especially in problem definition, idea development and finalizing design phases.

### Table 1. Students’ evaluation of the traditional process.

<table>
<thead>
<tr>
<th>Statements</th>
<th>Agree</th>
<th>Not Sure</th>
<th>Disagree</th>
</tr>
</thead>
<tbody>
<tr>
<td>I remained insufficient while designing because I do not have a user experience with the product</td>
<td>9</td>
<td>2</td>
<td>1</td>
</tr>
<tr>
<td>It was hard for me to build user-product relationship</td>
<td>8</td>
<td>1</td>
<td>3</td>
</tr>
<tr>
<td>It was hard for me to build usage scenario of the product</td>
<td>5</td>
<td>2</td>
<td>5</td>
</tr>
<tr>
<td>I needed user experience during the process</td>
<td>10</td>
<td>0</td>
<td>2</td>
</tr>
<tr>
<td>It was hard for me to empathize with user</td>
<td>8</td>
<td>1</td>
<td>3</td>
</tr>
</tbody>
</table>

As Table 2 presents most of the students agreed on the followings;

- The necessity and the benefits of co-design process when it is impossible to empathize with users.
- Participatory design eased the design process of the products that they did not experience before.
- User participation provided a better understanding towards users.

### Table 2. Students’ evaluation of the co-designing process.

<table>
<thead>
<tr>
<th>Statements</th>
<th>Agree</th>
<th>Not Sure</th>
<th>Disagree</th>
</tr>
</thead>
<tbody>
<tr>
<td>Participatory design is useful for building product usage scenario</td>
<td>12</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Participatory design is useful for building product-user relationship</td>
<td>12</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>I want to keep doing projects with user participation</td>
<td>11</td>
<td>1</td>
<td>0</td>
</tr>
<tr>
<td>The users were part of our design team</td>
<td>7</td>
<td>3</td>
<td>2</td>
</tr>
<tr>
<td>The users are experts of their experiences</td>
<td>10</td>
<td>2</td>
<td>0</td>
</tr>
<tr>
<td>People who are not educated in design could be co-designers</td>
<td>8</td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>People design better, together</td>
<td>10</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>I experienced ‘designing for users’ process</td>
<td>12</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>I experienced ‘designing with users’ process</td>
<td>12</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Co-designing process leads us to a better design</td>
<td>12</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>I did not have any difficulties in communicating with the users</td>
<td>12</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Everyone can be creative</td>
<td>6</td>
<td>2</td>
<td>4</td>
</tr>
</tbody>
</table>

Figure 2 illustrates the preferences of the students that when they think active user involvement helped more. According to responses users had positive contributions especially on problem and need definition, idea development phases but not on finalizing design.
3.2. Interview Results of Students

The interviews were conducted with four third-year industrial design students who developed design projects. 4 undergraduate students were asked to express their ideas and feelings about the co-design process and the co-designers.

Two out of four students have heard human-centered design, participatory design and co-design terms from their theoretical courses; however the other two have not.

From the students’ point of view, putting ‘designer touch’ by themselves made them feel more comfortable.

The study revealed that design students gained empathy on user experiences while users learned design thinking. When she was asked for her suggestions on co-design process, one of the students recommended that not only users but also other experts should be included.

4. Conclusion

This project provided an opportunity for undergraduate students of industrial design to work on a design project in collaboration with intended and experienced users of the product. Third-year industrial design students, none of whom have experienced co-design process before, experienced co-design process at problem definition and idea generation phases. At the end of the sessions students have learned how to communicate with real users.

By examining the role of the user within a participatory framework, this study proved that co-design process can provide a critical success factor as a useful method for design education. Including end users as co-designers, as a part of a design team, in design process is also beneficial for industrial design education.

User participation is not easy, in fact especially hard to achieve. However, this research showed that users can work as co-designers and play an important role of collective intelligence in design process.

Participatory design should include all the stakeholders such as; industry, users and student in the design development process. Teams should consist of more diverse professionals having different backgrounds and skills. Some kind of knowledge about a specific product that is required for design process can only be derived from users’ experiences. Thus, it is valuable to include users as a part of design team at the earlier stages of design process. Though collaboration, industrial design students can expand the field of knowledge surrounding a problem that they come across during the design processes of the projects.

Traditional design methods can be replaced with co-design methods to prevent the ignorance of user research in design process in design education when it is impossible to empathize with the users. Multiple perspectives from a group of students with different backgrounds can be brought together to create a design solution.
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References


