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DESIGNING URBAN FURNITURE THROUGH USER'S APPROPRIATION EXPERIENCE: TEACHING SOCIAL INTERACTION DESIGN

Pilar del Real, Oscar Tomico, Luis Pons, Joaquim Lloveras

ABSTRACT
Public spaces have simultaneous and non-exclusive roles. These platform characteristics must enable for mobility, leisure, spreading, recreation, meeting, exchange, etc. Our approach about designing urban furniture is closely related to service design and social interaction. We focus on the feelings and experiences from a better understanding of their subjective appropriation phenomena. This method is used in the teaching of the design activity to engineering students not especially familiar with this kind of contents. Filling a gap in design engineering education, that often lacks the input of knowledge of important functional subjective aspects and human experience interacting with other people.

Keywords: social interaction, user-centric design, user experience gathering tools

1 INTRODUCTION
We can find significant improvements in the definition of product criteria and requirements with the adoption of methods like "user centric design" applied to the early stages of information search, gathering and screening for design. The method helps also unveiling "user experience" combined with functional requirements. Precisely, our approach about designing urban furniture is closely related to service design and social interaction. We focus on the feelings and experiences that people have while for example: waiting for the bus, buying at newsstands, accompanying children to a playground, etc. Our intention is to analyze needs of persons in their role of users with the objective of making their experience more enjoyable and unique from a better understanding of their subjective appropriation phenomena (persons transform the space to reinforce their own personality traits, creating strong references that enhance their own identity).

Therefore, our approach to urban furniture design includes both objective and subjective contents; this method is used in the teaching of the design activity to engineering students not especially familiar with this kind of contents. We offer the course "Product Appreciation and Aesthetics" in the Engineering Design Department of the Technical University of Catalonia to solve that gap: Engineering education often lacks the input of knowledge of important non-functional subjective aspects, the human experience aspects of product use and aesthetics [1].

2 RESEARCH BASIS

2.1 Social interaction in public spaces

Public spaces may have two simultaneous and non-exclusive roles: on one side it is made of material – as part of space that structures an urban area and as a support of the development of human activities, as a social ground or dimension of relationships, expressions of tolerance, civic education, diversity, culture and identity, as an example.
These platform characteristics must enable for mobility, leisure, spreading, recreation, meeting, exchange, etc. All this is achieved thanks to a series of goods and services available to anyone without spatial differentiation [2]. As a consequence, designing urban furniture has certain difficulties that refer to the specific kind of such objects; these difficulties are in the core of the conflict that allows us to create innovative, efficient and meaningful proposals for users [3]:

- Urban furniture is intended to respond to either collective and individual needs
- Urban furniture proposals rarely includes the involvement of users

2.1.1 The appropriation of public use goods in the public urban space

Using the way animals mark their territory by instinct and defend it using an aggressive behaviour in case of need, human beings similarly appropriate their portion of space, make it personal and defend it. The comprehension of this phenomenon has been a subject of study for a series of disciplines that study human behaviour.
Appropriation means the process on how objects and places gain sense and how they are embodied in their everyday life (see fig. 1). The appropriation can be understood as; the need to transform space to feel it is ours, not for the mere transformation, but for the need to show us in it (projection). We need to adapt it to feel comfortable. In public space this fact is shown thanks to "possible" actions like: customary use of a place, adaptations to urban furniture of frequent use, chain in a bike parking, graffiti, etc. These ways reflect habits, values and way of life, preferences and phobia of people or groups that fill the place. This process creates a sort of equivalence relation between the space or object and users. Space will show the way of life of inhabitants, and the cultural differences in the appropriation process [4].

Figure 1. Analyzing the appropriation experience model with urban furniture - Shadowing method

2.2 User experience design tools: information gathering techniques

The method selected for the work is mainly qualitative; it offers the opportunity to find responses to questions around social experience, behavior, and personal relations, and between them and objects [5]. One main qualitative method is the ethnographic method, that uses field observation and interviews, as a search method; the method allows getting information on user's tastes and needs, a set of data of special interest in early

project stages that facilitates an increased flow of ideas for design.

2.2.1 Shadowing: field observation

Shadowing [6] means a follow up of users during the period when experience happens. The objective is to reveal behaviour related with:

- Activities: activities performed by users to achieve their objective that shape their experience.
- Environment /Context: space where the experience is developed, and allows us to identify the variables that have an effect on the user.
- Interactions: relations that user determines with every element that shapes user's experience.
- Objects: products or services that user consumes during the experience.
- Users: actors present before, during and after the experience that contribute with information on the different roles that appear

2.2.2 Semi-structured interview

User is asked precise questions in the moment that use experience takes place. The objective of the proposed interview is designing from the shown needs of users and their interactions. We use this method for the kind of objects that users normally have no participation in the process. Test's technical support, is the psychological Solution-Focused Brief Therapy, a work with scales on differential evaluation from Mark Beyeback [7]. Grading of the different parts evaluated for study is done and we continue computing and describing variations between and among the different grades obtained.
This test is a qualitative technique as explained, thus is used to obtain experience observations thanks to grading differences in the different elements. We make participants to explain aspects that made them evaluate the elements differently. Then scaling is used to deepen into the mental mechanisms of the participant and finally obtain interesting information for the design of the new object, space, etc. (analysis through the holistic user experience, discovering unexpected functions and desires that maybe have not been accomplished).

3 PRACTICAL EXAMPLE

The exercises developed were "the re-design of existing urban furniture". Students must consider technical or functional aspects associated to users' experience as a new perspective. They must see objects as part of bigger systems, where user and expectations, context and specific particular interests, service and constituents are all equally important [3].

3.1 Objectives

The course objective is teaching engineering students how to apply "user centric design methods" based in subjective experiences (as an example, students must take into account the user's voice during the conceptual phase of product development). It requires training them to improve their knowledge at dealing with:

- Experience gathering methods
- Subjective information
- User requirements in the field of urban furniture.

3.2 Procedure

Then, for project definition, students were divided into multidisciplinary groups. Four groups of four students each worked on different themes: the redesign of two specific playgrounds, a bus stop and a newsstand. They must analyze public furniture appropriation phenomenon with ethnographic observations. They had to do subjective interviews to get users experience with urban furniture (based in psychological analysis). Finally, they must use the information to redesign concepts and argument their own proposals.

3.3 Results

A practical, hands-on learn-by-doing approach [1] was adopted, in which students worked with modelling and visualisation and prototyping, as well as gathering and analyzing subjective information about social interaction. This served to accentuate their perceptive world beyond an intuitive thinking about user experience, broadening their creative skills. To help for a correct understanding of the design process and the kind of information obtained, a step by step example of a bus shelter design is described.

3.3.1 Step 1 (Field observation)

Initially, the place and the system were briefly explained, using text and figures. Information was mainly objective observations and was difficult to avoid biased information from students' own thoughts and experience. Besides that, user experience analysis allowed identifying key elements and relationships between them. See fig. 2.

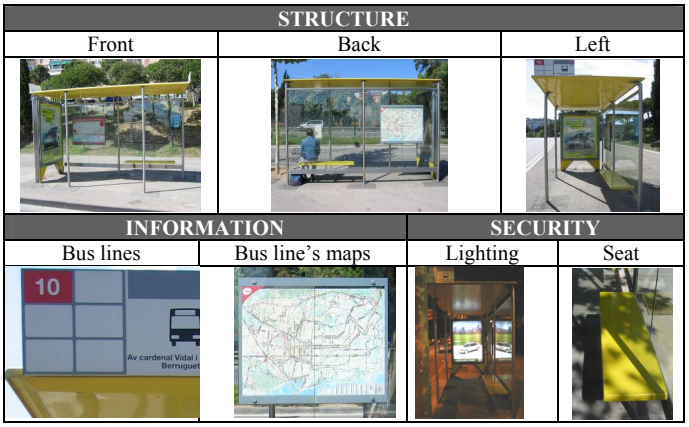

Figure 2. Part of Bus shelter's field observation.
Other aspects as location, access, capacity, etc. were also registered.

3.3.2. Step 2 (Semi-structured interview)

Talking with users while they were waiting the bus, playing with their children in a park or buying newspapers in a newsstand was difficult for the students. Conducting an interview about user experience was a demanding task but the information extracted became essential for unveiling and understanding users' desires not found in the field observation. See fig. 3 where analogies are used to clarify users' desires.

	PREFERENCE RATING (10 max)	EXPERIENCE INFO	EXPERIENCE IMAGES	ANALOGY INFO	ANALOGY IMAGES
Weather proof	**6 rain 8 sun 5 wind**	The sun doesn't bother you but it's not protected from hard rain and wind		Atmospheric phenomena doesn't affect it's use	
Info	**6**	Information in static screens dosen't give you info about delays		Realtime dinamic information to avoid anxiety	
Sitting while waiting	**5**	Limited space for sitting		Lot of people waiting in order	
Lighting and design	**5**	Bad lighting and oldfashioned design		Digital information, with a round shaped structure.	

Figure 3. Information extracted from the guided interview to a bus shelter user

3.3.3. Step 3 (Concept design)

Final proposals were represented with 3d modeling visualizations. All the former concepts were improved with features or characteristics following user's experience requirements as student's after three trial and error attempts to translate users' desires into physical concepts. See fig. 4 result of that process made by one group of students.

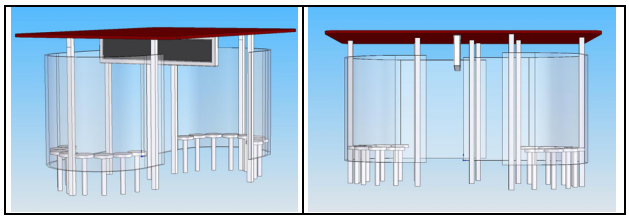

Figure 4. Final proposal for the bus shelter

3.3.4. Step 4 (Experience scenarios)

The use of context dynamic representation facilitates the correct translation of the desired user experience and social interaction into physical characteristics work helped them to communicate their work. See fig 5.

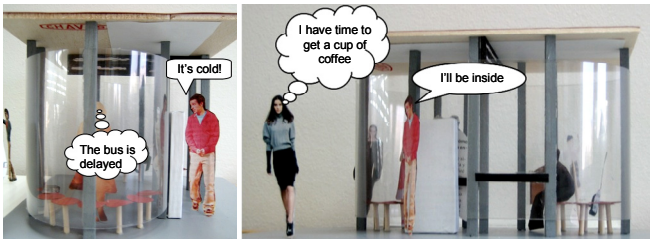

Figure 5. Sample of the proposed experience scenario

3.3.5 Final products

Final presentations mixed 3d visualitzations and real images to analyze their design in its real context and used dinamic content to relate it to the desired user experience. See fig. 6.

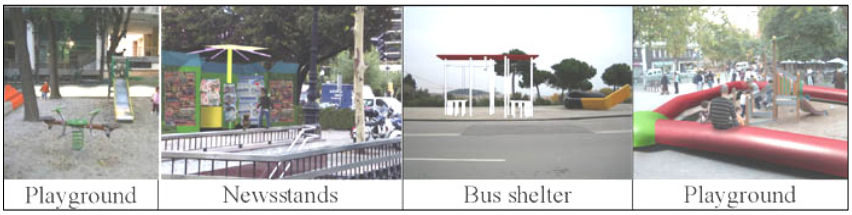

Figure 6. Final concept renderings from the different groups

4 CONCLUSIONS

Designing urban furniture with a social interaction approach is a challenging task for engineering students. Dealing with subjective information about users' appropriation experience was difficult and inspiring for them at the same time. Students took quite a long time to make the shift from pure functionality to experience design (this process can be seen through the assignment deliverables). The result of combining technical tools and interpreting emotions is attractive and leads to significantly improved designs, can be used to capture information for other design tools (QFD, Concept Evaluation and Selection Matrix, etc.), as well as submitting these designs to real users' experience.

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REFERENCES

[1] Montoya, J., Molokwane, S., Tomico, O. "*Searching for a balance between aesthetics and technical bias*". Proc. of 3rd EPDE Conference, Edimburg, 2005.

[2] Boyer, A et Rojat-Lefevbre, E. *"Aménager les espaces publics: Le mobilier urbain*". Le Moniteur, París. 1994

[3] del Real, P., Lloveras J. "*La Complejidad del Diseño de los Objetos de Uso Público: Su Significado Cultural e Identitario"* VII Congreso Latinoamericano de Humanidades y Diversidad Cultural, Jalisco, México, 2005.

[4] Pol, E., *La apropiación del espacio*. En L.Iñiguez y E.Pol (Coord) Cognición, representación y apropición del espacio. Barcelona, Publicacions Universitat de Barcelona, Monografies Psico/Socio/Ambientals nº 9, Barcelona, 1996.

[5] Reichardt y Cook, *Métodos cualitativos y cuantitativos en la investigación evaluativa,* Editorial Morata, Madrid, 1986.

[6] Rubin, Jeffrey, *Handbook of Usability Testing***,** John Wiley, New York,1994.

[7] De Shazer, S.. "*What is it about brief therapy that works?"* In Zeig, J. and Gilligan, S. (Eds) Brief Therapy: Myths, Methods, and Metaphors. New York: Brunner/Mazel. 1990.

Contact:
Pilar del Real Westphal
Project Engineering Department, Technical University of Catalonia.
Diagonal 647, pl. 10, 08028 Barcelona, Spain
e-mail: pdelreal@utem.cl - /Telf. +34934010706