User-Centered Design (UCD) applied to the identification and modification of unustainable practices

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Abstract. Metropolitan Autonomous University, Cuajimalpa Unit (UAM-C) has as one of its main themes, researching and teaching of sustainability. In it, the Bachelor of Design program considers among its teaching approaches those of User-Centered Design and Eco-design as important issues, this explains the interest in addressing the areas in which both approaches can be articulated to reduce unsustainable practices through the design of messages, environments and products.

Keywords: User-Centered Design; Eco-design; Misused products; Individual differences; Sustainable practices.

1. Introduction

Several causes contribute to environmental problematic, such as excessive resources depletion, contamination of natural resources or the reduction of biodiversity. Much has been spoken of the urgent need to halt this decline. From a design perspective the options often considered are dematerialization of products, design for disassembly, recycle of materials, use of low environmental impact materials and many other concepts. However, there have been less attended a number of issues that naturally emerge in the interaction of people with objects, such as the characteristics of users -*individual differences*-, how they use the products -*activities*-, the efficiency of objects during its use -*objects*-, or those related with use environments -*environmental characteristics*-.

Discipline of Design, through development of products, environments and services consciously or unconsciously stimulates emotions, attitudes and behaviors among individuals, and thus help or hinder the idea that society and nature are shift factors towards sustainability. Ideally, Design as a discipline, contributes to the transformation of the old paradigm in which economic factors or utilitarianism, and more recently the environmental performance of materials and production processes have been the key elements. Stated this way, the inclusion of the users in the design process, particularly the observation of the way they use products, could be a strategy to minimize the negative impact of misuse of such products on the environment. Such work involves a deeper exploration of the role played by individual differences of people in the use of products, and to assimilate them in the environmental friendly generation of proposals, consistent with those for whom products are addressed.

User-Centered Design (UCD) is a methodology for articulating various processes of design, long regarded as a fundamental aspect to understand the needs, goals, limitations, possibilities and previous experiences of users, and how those are affecting their interaction with objects. In fact, this interaction or use of objects, is one of the stages may have greater environmental impact, according to the Life Cycle Assessment (LCA), because this stage is been largely a black box in which user behavior have to be

just assumed, and paradoxically, needed to be presented in many different scenarios.

As mentioned already, the DCU systemically observed the interaction of users, their activities, the objects mediators of these activities and the environment in which activities are taken place, with the intention of designing efficient and effective messages, objects or environments, advocating for a successful use. Promoting all these designs are useful for different types of users such as pregnants, elder people, children, adolescents, individuals with disabilities or obesity among others, and valuing these differences from their physical, cognitive, socio-cultural and emotional characteristics.

Implementation of UCD strategies contribute showing - through the observation of practices, habits, beliefs and attitudes users have about objects- the unconscious information determining how to use, sustainably or not, those products, leading designers to a better understanding of those users, and jointly, contribute in the difficult task of modifying the concept users have over sustainable usage.

The sustainable use of products links together the Eco-design and User-Centered Design methodologies through the study of the achievement of goals and through caring about costs implied in reaching it out: financial or time investment, user´s physical and mental efforts. The indicators of these costs can be measured by the effectiveness, efficiency and satisfaction, understanding effectiveness as accuracy and completeness within users achieve specific goals; efficiency as the resources used in relation to the accuracy and completeness in which users achieve goals, and satisfaction as freedom from discomfort and the user´s positive attitudes toward products.[1]

As parts of the User Centered Design methodology

there are two basic stages in which different methods are applied, qualitative and quantitative types, to obtain data that allows designers to know specific characteristics of users, objects and context of use of such objects, and to assess to what extent their design proposals achieved the goals of users when interacting with objects. These two stages are inquiry and evaluation, and are particularly important in the process of UCD. The former is the beginning of the process in which designers have the first look at the context in which users operate; at this stage is useful to apply methods and techniques for inquiring on what the user thinks, says, does and desires. The later stage is evaluation and during it, stated objectives are contrasted against achieved goals, through the implementation of a test protocol applied during users interact with prototypes.

Figure 1 shows the various stages of UCD, and have been highlighted the stages of inquiry and evaluation in which there is a strong work around the application of methods and techniques for getting information that will derive in-depth understanding of user-object-activity-environment interaction. Understanding user's motivations, coupled with working around the external factors of the interaction (for example, the application of environmental regulations or norms, promotion of sustainability education) would contribute substantially to the creation of synergies that promote change in perception and avoid unsustainable users' practices. From the perspective of Eco-design rarely are discussed in the users' habits or routines when using products, so that implementation of the UCD in the Eco-design process can reinforce that point, widening the vision to one in which both methodologies are about the sustainable use of products.
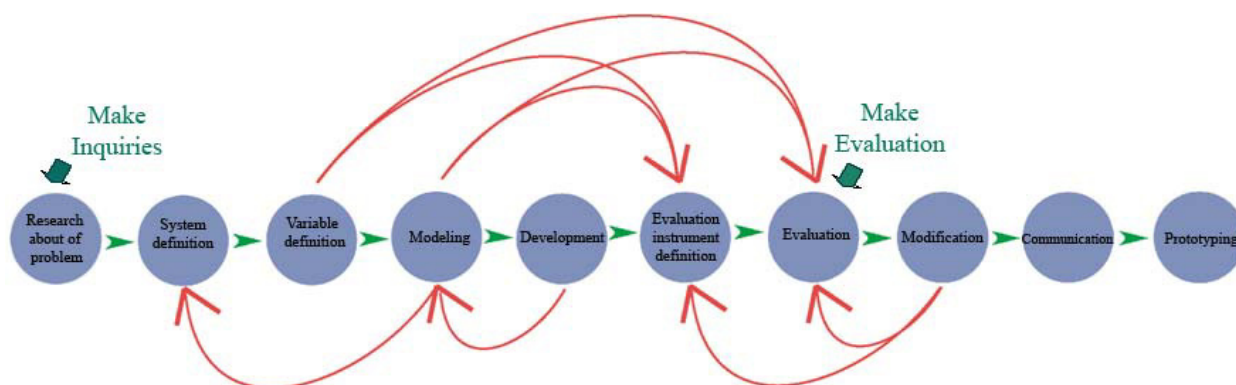

Fig.1 Stages of UCD.

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[1] For further information, see ISO 9241-11:1998

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