

# Chapter 7

## Designing E-Learning Applications with Students: The Case of the We!Design Methodology

**George N. Triantafyllakos**  
*Aristotle University of Thessaloniki, Greece*

**George E. Palaigeorgiou**  
*University of Thessaly, Greece*

**Ioannis A. Tsoukalas**  
*Aristotle University of Thessaloniki, Greece*

### ABSTRACT

*In years past, many methodological approaches, methods and techniques have been implemented based on the belief that users can and should be involved in the design process of technology products that affect them. Inspired by the findings of research involving users and particularly students at diverse levels and phases of the design process of technology products, we have developed the We!Design methodology, a student-centered participatory design methodology that assigns students a primary role in the design process. We present the various phases of the We!Design methodology, examine the results of its application in four different design projects (a web-based e-assessment application for tertiary education, a course website, an e-Portfolio application, and a Tablet-PC-based e-assessment application for secondary education) and elaborate upon our overall experiences with the methodology during the past 3 years. Participant evaluations indicated that the We!Design methodology was an adequate means for successful elicitation of students' needs and their application in educational software design.*

### INTRODUCTION

The participation of users at diverse levels and phases in the design process of technology products has become common practice within the HCI com-

munity. As pointed out by Kay (1990) and further elaborated in the seminal work of Druin (2002)

*"...the actual dawn of user interface design first happened when computer designers finally noticed, not just that end-users had functioning minds, but that a better understanding of how*

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*these minds worked, would completely shift the paradigm of interaction.”*

In recent years, many methodological approaches, methods and techniques have strived to achieve such a goal. The overarching link between all of these approaches is a commitment to the belief that users can and should be involved in the design process of technology that affects their work or their life (Ehn & Kyng, 1991; Bødker et al., 1991, Muller, 1991). There are only a few exceptions to this rule (Webb, 1996).

Children, and particularly students, comprise a unique group of participants whose perspectives as designers or merely initiators of educational activities in learning environments have not been adequately conveyed. This conclusion is further confirmed by Könings (2007) in a recent study investigating the desirability and feasibility of use of participatory design in education. In one of his questions on whether students convey their ideas about education to teachers, none of the students gave a positive answer. Various reasons are presented as justifying this negative result; namely, the fear that teachers will not use the information given by students, the fear of conflicts with teachers, and the lack of opportunities for students to convey their ideas. However, as shown in the same study, the majority of the students (58.3%) would appreciate the opportunity to engage in the participatory design of their education, while only 20.8% objected to that idea (Könings, 2007).

In this chapter, our objective is to present the main principles and issues governing the idea of the participation of students in the design process of educational technology products. We present the We!Design methodology, a student-centered participatory design methodology which aims at involving students in the design of e-learning applications and we look into the results of its application in four different design projects. Finally, we elaborate upon our overall experiences with the methodology for the past 3 years.

## **DESIGNING EDUCATIONAL TECHNOLOGY PRODUCTS WITH CHILDREN**

While the literature is quite rich in case studies of adult users participating in the design of technology products (e.g. Bødker et al., 1991; Muller, 1991), it is nevertheless limited when it comes to children as participants (Nesset & Large, 2004). There are two main reasons why this is the case. The first and most important reason is that children are an extremely diverse and special user group per se. Markopoulos & Bekker (2003) adopt Akuff and Reiher's four developmental stages to distinguish the following age groups for children: (a) the dependency/exploratory stage (ages birth–2 years), (b) the emerging-autonomy stage (ages 3–7), (c) the rule/role stage (ages 8–12), and (d) early and late adolescence (age 13 upwards). Each age group is characterized by its specific cognitive abilities, social behavior patterns, relations, preferences in technology products and interfaces, and so on. Thus, it is imperative that any team involved in design projects that plans to involve children in the design process should establish beforehand a deep understanding of children's cognitive, social and developmental traits and adapt its methods and techniques to the corresponding age group.

The second reason refers to the nature of technological products being designed by and for children. Any kind of technology designed for children is characterized by its inherent educational nature. Even though a more traditional perspective would suggest that technology for children could be divided into two broad categories, recreational and educational, the “all-learning” disposition of a child (Druin, 2002) gives a more or less evident educational character to all technology products. Typically, they must be conceived and designed in a way that they embody specific and complex learning theories and interface principles that, as a rule, children are aware of. Thus, it is not clear how children can contribute to the design of such products, when neither the domain knowledge

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