Chapter 1
Application of Direct and Indirect Human–Centered Design Techniques With Dyslexic Users

Dominik Hagelkruys
University of Vienna, Austria

Renate Motschnig
University of Vienna, Austria

ABSTRACT
Designing for people with special needs, especially cognitive and affective needs, can be challenging. Human-centered design (HCD), which inherently promotes user-inclusion and promises products that fit the users’ needs, seems to be an optimal solution for such tasks. But can an HCD-approach be easily applied with special needs users? How much adaptation is necessary to perform classical HCD-techniques with users affected by certain difficulties? This chapter discusses the insights gathered and strategies adopted while applying human-centered design in the LITERACY-project, a project of the European Union aiming at improving social inclusion of youth and adults with dyslexia, by creating an interactive web-portal. Hopefully, this case study provides insight on and gives courage for inclusion of end-users even though—or particularly because—they have special needs.

INTRODUCTION
In this chapter, the strategies applied and the experiences gathered while designing an interface for the LITERACY-portal, a web-portal for users with dyslexia, are described. For this purpose, dyslexic users were included already in the early phases of the human-centered design (HCD) process and functioned as active resources and frequent participants throughout the design-process. The inclusion of end-user is a critical success factor because the acceptance of any software-tool hinges on the degree to which the design-team manages to meet the (special) needs of the primary target groups. Therefore, the human-centered design process makes an optimal fit for the goals this project is trying to achieve.

Before users could actively be included into the process, the initial steps of the human-centered design process needed to be applied. Starting with analyzing the future users, by studying articles, looking at existing web-applications targeted at them, and personally talking to dyslexic persons the design-team already was in contact with. Based on this information potential tasks that might be performed on the LITERACY-portal were extracted and described. These tasks were generated by applying three of the core elements of the HCD process: personas, context analysis and task analysis.

The main strategy was to get in contact with people with dyslexia already in the early stages of the design. Through this interaction with the targeted audience, the research team tried to generate insights, not only regarding the special needs of the targeted user group, but also regarding special strengths of people with dyslexia. These initial contacts were followed up with literature research and preparation of key questions such as to be knowledgeable partners in the dialogue, but otherwise as open as possible to learn from their life stories and experiences. Following this mindset, it was considered to be most beneficial to engage in semi-structured interviews with dyslexic persons in various stages of life, and to gradually focus on some of their core issues that crystallized from the interviews such as finding work, using the internet, interacting in/with educational institutions, etc. The interview-partners also provided information regarding their individual preferences for screen designs and what terms they found relevant or interesting to look for on the LITERACY-portal.

Furthermore experience became a key factor during the design-process. Therefore, one goal for this chapter is to highlight issues worth specific consideration in order to share gathered experiences with interested peers, thus making the applied process reusable in the community of interface designers. In a nutshell, getting in contact with users with special needs may need special provisions, contacts with counseling centers, more time than talking to “ordinary” users, and an adaptation of methods and/or tools and procedures to accommodate for the particular special needs.

This chapter is structured as follows: the subsequent section discusses the background in which this research was conducted and provisions that were taken to maximize end-user inclusion in all aspects of the design process. Additionally, related work and studies that influenced different aspects of the research design are mentioned. Following the applied design strategies and the process of including people with dyslexia into the various design-steps through individual direct and indirect means of end-user inclusion are described. The particular experiences of included dyslexic users will be highlighted throughout this section. The final sections summarize the conducted research and experiences so far and give an outlook on further work. The contribution intends to confirm that the inclusion of end users in early stages of web-design is essential and that it should be done regardless of whether end-users have special needs or not. Furthermore, the chapter illustrates some concrete techniques and steps to include end-users with dyslexia and thus can serve as an example or inspiration on how to accomplish and exploit end-user inclusion for increased usability of a web-portal.

**BACKGROUND AND RELATED WORK**

The context in which HCD was applied is the LITERACY-project, a European-wide research endeavor funded by the European Commission in the area of ICT under the FP7 program. Its aim was to create an advanced online portal, the LITERACY-portal, which enables dyslexic youth and adults to acquire learning skills, accommodation strategies and methods for succeeding at literacy related tasks at work and at home. The portal provides personalized e-learning programs, useful tools and methods for help-