ABSTRACT

This article presents the case study of a cooperative Web-learning environment — SOCRATES — to foster barrier-free learning on the Web. While the growth of the Internet was exponential in the last years, still many communities don’t benefit from Web-learning technology due to improper tools and constricted communication processes. These problems increase when developing applications for communities of people with special needs. SOCRATES supports a community of learning comprising patients suffering from aphasia (aphasics), therapists, researchers on linguistics, and system developers. Aphasics can improve their conversation skills with a specially designed talk/chat tool, while therapists and linguistic researchers can monitor conversations from automatically generated transcripts. Aphasics in remote areas using SOCRATES are now able to communicate freely among each other without being afraid that they might get lost in rapid conversation in a distributed privacy protecting virtual community.

Keywords: discourse analysis; learning communities; Web-based learning

INTRODUCTION AND RELATED WORK

Acquired language disorders are one of the most frequent and long lasting consequences of stroke or traumatic brain injury. Aphasics suffer from a language difficulty because of a brain injury, called aphasia, that affects one or more aspects of the complex process of comprehending and formulating verbal messages resulting from newly acquired disease of the central nervous system (Damasio, 1981). Aphasia is the Greek word for without speech, which is only partially correct, since the brain injury might affect speech, understanding, reading, and writing in different
degrees. Depending on location and degree of the brain injury, those affects are more or less serious.

Aphasics are not mentally handicapped. They can think logically and are able to understand and interpret situations correctly. As a rule, aphasic disorders are treated by speech therapists (logopedists) in clinical settings with either inpatient or outpatient regimen (Huber, Springer & Willmes, 1993). The frequency of prescription decreases with increasing duration of the handicap, even if quality of life remains low. Even though many patients need high-frequent, long-term therapy, it often cannot be provided for organizational or financial reasons. Therefore, aphasics — especially those living in remote areas — have begun to organize themselves in self-help groups and meet in regional centers like the aphasia self-help center in Unterfranken with whom we are cooperating (http://www.aphasie-unterfranken.de/). Unfortunately, meetings can be organized only a few times a year, because transportation costs are too high and not funded by the German public health system. To avoid isolation caused by the lack of money, there is a need for additional communication and learning/therapy means like the Internet. Especially young aphasics have shown strong interest in the use of technology for communication and learning with other people.

If we speak about learning or electronic/Web-based learning (e-learning) in this article, we address social learning and community building processes by means of digital media. Accessibility for Web technologies and online learning has been recognized as an issue of increasing importance for the HCI (Human Computer Interaction) community and the European Community (Miesenberger, Klaus & Zagler, 2002). However, aphasics seldom have been considered as a target community for accessible Web-based tools up to now.

One of the few existing tools for aphasia patients is a package of training software aimed at teaching aphasics the most important everyday words (Lányi et al., 2004). A master thesis at UBC recently proposed a tri-modal approach to overcome word finding problems of aphasics by combining images, text, and sound to represent words and concepts in everyday life applications such as a dictionary, recipe book, or daily planner (Moffatt, 2004). Accessibility for e-learning environments and its consequences for synchronous and asynchronous communication and collaboration tools is analyzed in Guenaga, Burger, and Oliver (2004). Research on Web standards for supporting accessibility can be found in Mohamad, et al. (2004).

However, recent research in this area focuses mostly on individuals and people suffering particular motor deficits (e.g., input assistance by developing touchpads for handicapped or elderly people) (Holzinger, 2002), adaptive interfaces based on biofeedback sensors (Velasco et al., 2004), or PC control by eye movement (Fejtová, Fejt & Lhotská, 2004). Mohamad, et al. (2004) present an approach on pedagogical aspects in applications for children with learning disabilities. Other approaches aim at voice recognition, facing problems due to misrecognition, depending on the pronunciation (Privat et al., 2002). Similarly, predictive systems as well as auditory user interfaces up to now lack reliability in recognition (Lauruska & Musteikis, 2002; Willis 2002). The system of Baptiste-Jessel, et al. (2004) tries to support blind people to access graphical Web-based documents with a special steering device. A similar approach can be found in Rotard, Otte, and Ertl (2004). Alternatively, Chene
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