

# Improving Accessibility for Seniors in a Life-Long Learning Network: A Usability Study of Learning Websites

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## ABSTRACT

*Senior citizens are comparatively vulnerable in accessing learning opportunities offered on the Internet due to usability problems in current web design. In an effort to build a senior-friendly learning web as a part of the Life-long Learning Network in Shanghai, usability studies of two websites currently available to Shanghai senior citizens were conducted, with the intention of integrating these websites into a senior learning web as well as promoting accessibility for senior users. Through this study usability problems were identified generating suggested changes for designing websites focused on learning by seniors. This study contributes empirical findings to the field of information system design and its accessibility for seniors.*

*Keywords: Accessibility, Life-Long Learning, Senior Friendly, Usability, Web Design*

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## 1. INTRODUCTION

Life-long learning refers to a society in which learning possibilities exist for everyone who wants to learn (Aspin & Chapman, 2000; Fischer, 2001). With a senior population of 21.6% in Shanghai, China and growing (Shanghai Civil Affairs Bureau, 2009), senior citizens of Shanghai are among the target users of a Life-long Learning Network. This network is an implementation of the Life-long Learning

Initiative, which is being developed with the goal of building Shanghai into a learning city for 'anyone, anytime and anywhere' (SMC, 2006).

There is substantial growth in the use of the Internet by older people (Morrell, 2005; Becker, 2004a; Wick, 2004; Nahm et al., 2006; SCAB, SBSC, & SSB, 2009). However, many of the senior Internet users are not taking full advantage of online resources due to usability and accessibility issues common to elderly participants (Morrell, 2005; Dickinson & Gregor, 2006; Aula, 2005). Computer software and most web content are usually developed by and for

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younger users; lack of consideration for the elderly and the problems associated with aging, such as computer experience and attitude, age-related constraints, language barriers, and software complexity (Dickinson et al., 2005) contribute to the problems of usability and accessibility.

In the work reported here we consider the terms senior citizen or elderly refers to those who are 60 and older as is common in China (Chinese Government, 1996), while in most developed countries 65 has been accepted as definition of older people (Arch, 2008).

The Life-long Learning Network has identified a number of websites with content appropriate to the elderly with the intention of integrating these sites into the learning network for seniors in Shanghai. From the current set of websites identified as having the elderly as the target audience, a representative site from two groups has been chosen: one is from the group of the websites developed by senior related agencies, and the other is from the group of websites developed by corporations. The criteria for selection are that they are learning oriented, and the design of the website has been based on some kind of senior-friendly requirements. The objective of the current work was to examine these existing sites using usability guidelines for usage by the elderly so as to identify needed improvements in the sites as well as to build new knowledge about the use of guidelines in designing websites for the elderly. Thus, we conducted a usability study of each of these two selected learning websites. Lessons learned from the study will be used to improve the usability and therefore improve accessibility of the learning opportunities for seniors in life-long learning network. The usability requirements found in this study can also contribute to the field of information system design and its accessibility for seniors in general.

## 2. RELATED WORK

Research shows that seniors are increasingly using the Internet to access information, to meet

their needs for fun and mental stimulation, for education, to increase their social interaction and to serve as a useful medium to provide them information with a high level of interest in health information (Hendrix, 2000; Nahm et al., 2006; Arch, 2008). However, even websites that are designed to be compliant with accessibility standards catering to specific impairments may be ineffective in enabling access for older adults (Dickinson et al., 2007). The accessibility problems aged people encounter are mainly attributed to the lack of awareness and implementation of usability design guidelines dedicated especially for the senior users group (Morrell, 2005; Dickinson et al., 2007; Aula, 2005).

As a group older adults are vulnerable with lower education, cognition effects and chronic disabilities normal for aging such as poor vision, hearing impairments, and declining motor skills (Becker, 2004b; Kurniawan et al., 2006; Wick, 2004; Emery et al., 2003; Arch, 2008).

A significant proportion of older adults have low literacy and also low computer literacy compared to young adults (Dickinson et al., 2007; NAAL, 2003; Department for Education, 2003; SCAB, SBSC, & SSB, 2009). A primary barrier older people face when trying to use the web is lack of familiarity with computers and the conventions used in computer software, especially for those with less education (Dickinson et al., 2005). To add to this, aging is associated with cognitive changes, such as reduction in the efficacy of short term memory, spatial memory and certain forms of reasoning and generalization of knowledge (Dickinson et al., 2007), thus accessibility barriers include difficulties in remembering task-related steps, understanding technical words and using the mouse (Sharit et al., 2008; Sayago & Blat, 2009). Research shows that older adults are less likely to complete tasks that require three moves or more, and they have more difficulty recalling previous actions and the locations of previously viewed information (Morrell, 2005).

Further, chronic disabilities, such as poor vision, hearing impairments, and declining motor skills also affect accessibility to information

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