User Preferences for Web-Based Module Design Layout and Design Impact on Information Recall Considering Age

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ABSTRACT

Research in design of Web-based modules should incorporate aging as an important factor given the diversity of the current workforce. This work aims to understand how Web-Based Learning modules can be designed to accommodate young (25-35 years) as well as older (55-65 years) users by: (1) identifying how information sources (instructor video, banners, and PowerPoint slides) within a Web-based module impact user information recall; and (2) distinguishing if there are any module layout preferences based on module content, participant gender, and age group. The results from the study show that information recall significantly varied based on age group and Web-based module content, and provide empirical evidence to suggest a general preference for placing the video in the left-upper corner of a Web module screen.

Keywords: Adult Learning, Distance Education, Human-Computer Interface, Lifelong Learning, Multimedia/Hypermedia Systems

INTRODUCTION

Technology is an effective medium for fostering educational and training methods. Current research and increased enrollment in online courses shows that an enormous amount of distance learning modules are being designed by many universities and private entities. The rapid growth of distance learning offerings along with available software packages for developing online courses arises concern as these courses are being created based on studies that evaluate a limited number of features such as performance, acceptance, quality, or satisfaction for a specific group of users. Many studies focus on a single age group, which may be a strong methodological trend

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or simply a reflection of the convenience of these samples and the ability to control variables within them (Gottwald, 2005).

Statistics show that in 2008, 20% of all undergraduate students had taken at least one class via distance education (Walton, 2011). In 2011, 89% of four-year public colleges and universities offered online classes, while only 60% of four-year private schools provided these courses (Parker, Lenhart & Moore, 2011). From an organizational standpoint, employers with a diverse and aging workforce are expected to provide inclusive workforce development and learning programs (Githens, 2007) to ensure organizational viability and competitiveness. Therefore, organizations must continually innovate and adapt to the ever-changing knowledge-based environment in which they operate. In this sense, “technology presents a great deal of opportunities for developing education and training. Specially, audio and video communication technologies have become useful tools for extending the research of training and staff development. Unfortunately, many of these opportunities are missed due to the lack of technology adoption and assimilation” (Rau & Hsu, 2005).

Fulfilling the instructional design needs for the continuously aging population represents a challenge. One of the approaches that can provide a feasible solution to the perhaps inappropriate designs for the aging is universal usability. This concept, proposed by Norman (2004), meaning “barrier free”, suggests that one design would include and accommodate older and less experienced users and simultaneously, incorporate younger and more experienced users. Related to universal usability, the concept of inclusion is used to address the needs of people with disabilities, the elderly and other disadvantaged groups (Arch, 2008). Although this might seem a perfect solution, in the search of accommodating an aging population, there is also the belief that this approach is utopian and therefore, designers must target a specific population (Hawthorn, 2000). Nowadays, the common practice when designing for older adults is building a restricted interface or computer environment to eliminate misunderstanding and limiting the execution of undesired actions, when the goal should be to use natural constrains or common life restrictions (Burrell & Sodan, 2006).

Our interest is to understand how Web-based learning modules can be designed to accommodate young as well as older users. In this study, an aging individual is considered, as defined by the Age Discrimination and Employment Act (ADEA), as any individual over 40 years old. The aging literature proposes two main theories that impact learning: (1) a biological declining functions learning theory and (2) accumulation of knowledge. The biological declining functions theory states that the decline in biological functions affects the ability to learn and to perform many work related tasks (Cronholm & Schalling, 1988; Burke & Mackay, 1997; Rabbitt & Lowe, 2000). The accumulation of knowledge theory suggests that the accumulation of knowledge and experience leads to an increase in skills with age (Westerholm & Kilborn, 1997; Kowalski-Trakofler, Steier, & Schwerha, 2005). Others believe that there is not enough information to determine a definitive answer (Colley & Beech, 1989; Bruyer & Scailquin, 1994). Moreover, with age there is a reduction in functions, both physical and cognitive. According to Czaja (1996), cognitive functions decline, producing changes in the attention process, working memory capabilities, discourse comprehension, inference formation, intelligence, language, and information processing speed. These changes may impact the ability of older adults to acquire new skills. Also, physical changes in vision might have a noticeable impact over cognitive changes. Most of these changes are generally considered to be noticeable at a chronological age of 55 years. After age 55, the ability to divide attention between tasks declines as well as attention capacity, therefore affecting performance in concurrent activities with competing displays of information. According to Hawthorn (2000), older adults get very distracted by visual noise, backgrounds, and graphics.
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