Exploring the design criteria of website interfaces for gender

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ABSTRACT

The interface is the major channel through which users to navigate a website to find information matching their needs; nevertheless, gender-specific preferences for websites interface design have not been sufficiently explored or evaluated based on comprehensive and systematic approaches in past research. This study investigated the website interface design criteria for users of different genders based on usability principles. Undergraduate and graduate students in Taiwan were selected as the target sample. A total of 236 valid questionnaires were analyzed. The results showed significant gender differences in scaling of the importance of website interface design criteria. The three most important website interface design criteria for males were compatibility, minimal action, and flexibility, whereas the three most important design criteria for females were compatibility, learnability, and user guidance. This paper discusses the possible explanations for the gender differences and their implications for website design.

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1. Introduction

A review of the literature reveals that individual differences significantly affect personal learning in hypermedia systems such as websites (McIlroy et al., 2001; Chen and Macredie, 2002; Chalmers, 2003). Among the individual differences, gender may be perceived and accommodated most easily by website interface designers (Hsu, 2006). Early studies confirmed that females reported less computer self-efficacy and more anxiety when using a computer, which presumably lessens satisfaction with computer use, and by association, with enjoyment of online shopping (Colley et al., 1994; Brosnan and Davidson, 1996; Jackson et al., 2001). Therefore, it also has been assumed widely, and often validated empirically, that females and males differ in their attitudes toward, comfort with, and anxiety about Internet technology (Rozell and Gardner III, 2000; Shaw and Gant, 2002; Sanchez-Franco, 2006; Mitra et al., 2005; Tuch et al., 2010).

Several researchers have suggested that females might have less competence and a less positive attitude toward using the Internet than males (Sherman et al., 2000). It has also been reported that females have much higher anxiety about using the Internet than males do (Ong and Lai, 2006; Huang et al., 2013). Further research found that males reported a more satisfying online shopping experience than females did (Simon, 2001; Dittmar et al., 2004; Cyr and Bonanni, 2005). Although the point has been made that the gender gap on the Internet is related to the frequency of web use—that is, females tend to use the Internet less frequently and less intensely than males do (Bimber, 2000)—some studies have demonstrated that the frequency of access to and participation on the Internet is almost equal in the two genders (Jackson et al., 2001; Mitra et al., 2005). In fact, females visit certain websites, such as travel websites, more often than males do (Kim et al., 2007). Therefore, the gender gap on the Internet needs to be investigated further if it is to be explained.

It is possible that the gender gap on the Internet is caused by differences in preferences for specific aspects of website interface design; that is, if the website interfaces are not designed to suit females, then female visitors will experience frustration and anxiety while navigating the website and thus have lower satisfaction. Previous research has reported that males and females have different preferences for website design. In an investigative study, Cyr and Bonanni (2005) reported that males preferred websites with well-presented information, easy navigation, and meaningful website animations. Moss et al. (2006) found that the website design preferences of males included formal typography and images, visible horizontal lines, and mainly black or blue color schemes; the preferences of females, on the other hand, included informal typography and images, invisible horizontal lines, and mainly pink, mauve, or yellow color schemes. Hsu (2012) further compared gender preferences for blog types and found that females

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were more likely than males to prefer blogs that were aesthetically attractive and emotionally expressive.

From the above, it is clear that much attention has been focused on significant gender differences in preferences for the aesthetics of websites. What has not received sufficient attention is the gender differences in preferences for the usability of websites, which have not been explored or evaluated based on comprehensive and systematic approaches. It is also possible that aesthetics is linked to usability to the extent that websites can be used to achieve goals with effectiveness, efficiency, and satisfaction (Di Blas et al., 2009; Chowdhury et al., 2014).

As website functions become more complicated, users require access to natural and convenient user interfaces (Jung and Im, 2015), which is achieving a high level of usability. Usability includes also the concept of efficiency understood as the minimization of physical and mental effort using the interface (Gaspar et al., 2014; Ozok et al., 2014). In general, usability principles have been developed with consideration of the human information processing model (Lin et al., 1997). If website interfaces are designed based on usability principles, then users can navigate the websites enjoyably (Wang and Huang, 2015). Actually, past research into the gender influence on object choice showed that gender affects human behavior in terms of information processing (Weiser, 2000; Hsu, 2012). Males and females are known to process information differently, and this difference spills into various areas of information technology communications, such as websites (Simon, 2001; Sanchez-Franco, 2006). According the selectivity model proposed by Myers-Levy (1986), females are comprehensive processors, who are likely to absorb all available information before arriving at a conclusion, while males are selective processors, who count on specific and readily available information. This model, translated to a website navigating condition, implies that female users will be distracted by information that is not related to the goal and their efficiency of navigation thus reduced. The superfluous information that they gather is likely to exceed the capability of short-term memory (Lai et al., 2014). Therefore, Simon (2001) more specifically suggests that given the comprehensive information processing strategy preferred by women, females using a website may exhibit lower levels of favorable perception and satisfaction if the website fails to deliver gender-relevant information.

In addition, gender differences in spatial visualization ability, a feature of information processing, have been reported in the previous literature for certain types of tasks (Mackintosh and Bennett, 2005; Kaufman, 2007). Spatial visualization is the ability to understand, manipulate, and interpret visual or spatial representations (Kozhevnikov and Thornton, 2006). Spatial visualization ability has frequently been linked to performance in navigation (Nilsson and Mayer, 2002; Downing et al., 2005), and is generally higher in male than in female computer users (Voyer et al., 1995; Cutmore et al., 2000). That is, it has been found that male users with high spatial visualization ability perform better and faster on information search tasks than female users with low spatial visualization ability skills in the context of website navigation. However, an interface could provide support for users with low spatial visualization ability to improve their navigation performance on a website. Zhang and Salvendy (2001) tried to reduce the overhead of a web navigation system by putting all of the links on a single interactive menu on all pages, and found that spatial visualization ability did not affect how many relevant pages a subject found in the new design interface of a website.

To sum up, the usability principles for interface design are related to the human information processing model, but the models for males and females differ. That is to say, the differences in website interface design criteria ranked as important by male and female users might be explained in terms of information processing. Thus, the main purpose of this study was to explore the website interface design criteria for users of different genders based on usability principles.

2. Method

2.1. Participants

The target population of this study was undergraduate and graduate students in the nine colleges and universities of Taoyuan County in Taiwan. A convenience sample of total of 300 participants were accessed and quantitative paper questionnaires adapted in Chinese from the Purdue Usability Testing Questionnaire were sent to the respondents. A total of 289 (96.3%) of the questionnaires were completed and returned. The number of valid questionnaires for data analysis was 236, including 113 (47.9%) males and 123 (52.1%) females. Among the participants, 116 (49.2%) majored in business administration, and 120 (50.8%) majored in system engineering; 132 (55.9%) had low frequency of Internet use (below 5 h a day), and 104 (44.1%) had high frequency of Internet use (more than 5 h a day); 130 (55.1%) were less than 20 years old, 63 (26.7%) were between 21 and 25, 27 (11.4%) were between 26 and 30, and 16 (6.8%) were older than 31 years old.

2.2. Measures

The Purdue Usability Testing Questionnaire (PUTQ) was mainly developed to measure the usability of software systems, not simply user satisfaction (Lin et al., 1997). The eight principles (criteria) identified in the PUTQ are relevant to human–computer interaction task requirements and are supported by previous empirical studies. For instance, compatibility, the first principle of PUTQ, occurs whenever implicit or explicit spatial relationships exist among stimuli and responses (Lin et al., 1997). Many studies have successfully used the PUTQ to assess the usability of websites (e.g. Keevil, 1998; Harms et al., 2002; Zins et al., 2004) because the questionnaire offers an exhaustive list of usability issues for system interfaces (Yang et al., 2012). This study converted the PUTQ to a 6-point Likert-type scale, to investigate the design criteria for website interfaces to which male and female users attached importance. To meet the purposes of the study, the items on the PUTQ were modified slightly; namely, question items were changed from interrogative sentences to declarative statements to assess the importance that the participants attached to various website interface design criteria. For example, I think that the results of command entry are compatible with user's expectations is important. Higher scores indicated greater importance for the design factor of the website interface. Detailed descriptions of each design factor follow below.

(1) Compatibility: This refers to mental model compatibility, as well as to stimulus-response compatibility. If the operations of the systems are designed such that they are similar to users' daily activities, the compatibility is said to be high. Examples of items are, "The results of command entry are compatible with user's expectations", "The control is matched to user skills", and "The coding is compatible with familiar conventions".

(2) Consistency: If the interface is designed in a consistent manner, the user can familiarize him/herself with the interface more easily and know what to do in different circumstances. Examples of items are, "The coding is consistent across displays, menu options", "The feedback is consistent", and "The data display is consistent with user conventions".