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Critical success factors for motivating and sustaining women's ICT learning

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ABSTRACT

Information Communication Technology (ICT) has changed the way people think, behave, communicate, and work. As a result, digital literacy, an essential skill for career development, lifelong learning, freedom of expression and social inclusion, is now one of the most important issues facing women today. The aim of this study was to identify the key factors and the possible mechanisms that motivate middle-aged and older females to acquire and utilize ICT skills. Drawing on Social Cognitive and Social Capital theories, we developed a theoretical model and validated it through Partial Least Squares (PLS) and mediation analyses. A survey was administered to 181 participants in an ICT learning program for digital-illiterate and middle-aged females. 133 responses were available for final analysis. The study revealed that social capital does not directly predict computer self-efficacy but depends on learning satisfaction as a mediator. In other words, unless participants develop a sense of satisfaction in class learning, a high level of social capital may not transfer into a high level of computer self-efficacy. In addition, our study shows that computer self-efficacy mediates the relationship between learning satisfaction and ICT usage, and that ICT usage and social capital both predict increases in subjective well-being. ICT utilization plays an important role in the well-being of the middle-aged and older females who often are unable to use ICT regularly due to their cultural roles. This study provides practical implications for the delivery of ICT training programs for females and other under-privileged groups.

1. Introduction

In today's information society, digital literacy is an essential skill for professional and career development, lifelong learning and distance education, as well as for social inclusion, and freedom of expression and opinion (Eshet-Alkalai, 2004; Ezziane, 2007; Horton & Unesco, 2008). Information Communication Technology (ICT) not only provides a new way of conducting economic and business practices, but also changes the way people think, behave, communicate, and work (Walsham, 2005). For example, through participating in ICT learning groups and interacting with friends and group members over the Internet, people can enrich their feelings of recognition, belonging, and acceptance (Amichai-Hamburger, 2005, p. 27–55, 2008; Shapira, Barak, & Gal, 2007). ICT utilization therefore plays a part in promoting individuals' well-being by expanding their experiences and stimulating their psychological states of happiness and satisfaction (Amichai-Hamburger & Furnham, 2007; Contarello & Sarrica, 2007; Shapira et al., 2007). Subsequently, significant investments have been made over the past decade to expand accessibility to computers and the Internet (Dewan & Riggins, 2005). However, an early report shows that, of the 771 million adults who are still digitally illiterate, the majority are women (Dighe & Vyasulu, 2006). Indeed, digital illiteracy, following poverty and violence, is the third most important issue that women face globally (Morgan, Heeks, & Arun, 2004; Primo, 2003). Furthermore, the considerably less frequent use of ICT in work and social contexts by women compared to men is still widely reported (Carpenter & Buday, 2007; Liff, Shepherd, Wajcman, Rice, & Hargittai, 2004; Shen, Zhang, & Tarmizi, 2009).

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Past studies on women's ICT utilization have mainly focused on gender differences in ICT experiences. In general, the findings reveal that women differ significantly from men in their attitudes toward technological ability (Dimaggio & Hargittai, 2001; Durndell & Haag, 2002; Imhof, Vollmeyer, & Beierlein, 2007; Kennedy, Wellman, & Klement, 2003; Li & Kirkup, 2007). Specifically, gender difference has been found in the levels of experience, computer-related anxiety, and skills, showing that women have lower computer self-efficacy, higher computer anxiety, and passive attitudes towards the Internet (Busch, 1995, 1996; Durndell & Haag, 2002; Hsiao, Tu, & Chung, 2012; Poelmans, Truyen, & Stockman, 2012; Tsai & Tsai, 2010; Vekiri & Chronaki, 2008). In addition, women who value social connections and relationships tend to attach more importance to affective conceptions when learning ICT (Imhof et al., 2007; Shen et al., 2009) and use ICT more for social reasons than men (Bimber, 2000; Price, 2006). Liff and Shepherd (2004) also show that females are likely to underrate their ICT competence. Consequently, they restrict the forms of ICT they use and have lower levels of confidence in using the technology. More recently, several studies have shown that, despite the possible narrowing of the traditional gender gap in computer self-efficacy, a significant gender divide persists in advanced computer self-efficacy necessary to obtain the benefits of using ICT (Castano, 2008; Hsiao et al., 2012; Tsai & Tsai, 2010; Vekiri & Chronaki, 2008). This lack of advanced computer self-efficacy seems to be caused by the fact that females perceive less support and encouragement in both general- and career-context ICT usage (Castano, 2008; Hsiao et al., 2012; Vekiri & Chronaki, 2008). More importantly, gender stereotyping and social context have been reported as causes of computer anxiety and negative attitudes toward ICT among women (Bimber, 2000; Cooper, 2006; Merriam & Ntseane, 2008).

The review suggests that there have been few studies on how to involve different cohorts of women in learning and utilizing ICT (Bandias & Warne, 2009; Chu, 2010; Lin, Tang, & Kuo, 2012). Indeed, while most ICT non-users are middle-aged and older females, the majority of studies related to the gender digital divide have relied on the young generation, such as college and high school students, as study participants (Tsai & Tsai, 2010). For example, among the six million ICT non-users in Taiwan, four million were females (Chang & Shieh, 2009); over 90% of women under the age of 40 years have access to ICT, yet the rate drops to less than 25% for women over the age of 50 years. It is therefore critical to investigate how to encourage digital-illiterate females to learn and sustain ICT usage.

An opportunity for conducting a study aimed at identifying critical factors in motivating middle-aged and older females to learn ICT became available in 2005 when a leading international software company launched the Taiwan Women Up (TWU) project. TWU's initial objective was to improve the digital literacy of information-underprivileged women by working with a variety of charitable groups and Non-Profit Organizations (NPOs) in Taiwan to recruit female volunteer workers as trainees. From 2005 to 2006, TWU trained more than 700 volunteer workers. This encouraging outcome led TWU to expand its NPO partners. By the end of 2009, more than 5500 female trainees had completed the TWU project.

The success of TWU exceeded original expectations. The present researchers therefore conducted an in-depth interview study with 28 TWU participants and instructors in 2007 (Lin et al., 2012). One important finding was that, after finishing the TWU program, participants' levels of life satisfaction improved as they were able to regularly use ICT to obtain important information for themselves. In addition, they were able to re-focus their lives, and were delighted by compliments from family members and others about their new-found ICT skills. In other words, ICT learning and utilization helped raise the level of well-being for TWU participants who felt more content with their lives both within their family and within their other social relationships. Further analysis of the interview data showed that this increase was likely to be influenced by the social support they received from one another both during and after the ICT training course. In addition, there was a high level of satisfaction with the education program and a substantial rise in TWU participants' level of competence after completing the TWU program. Since the lack of computer self-efficacy was, for many participants, the main barrier to using ICT before taking part in the TWU program, the increase in computer self-efficacy seemed to play a critical role in their enhanced ICT usage after TWU participation as well as in affecting changes to levels of well-being. Inspired by the success of TWU and insights revealed from the interview, we decide to conduct a quantitative study of middle-aged and older females' ICT learning and utilization.

2. Literature review

2.1. Social capital

Social capital, originally developed in sociological realms and later applied to organizational and managerial practices (Huysman & Wulf, 2004), refers to interpersonal ties, expectation, trust and recognition in social communities with common context and shared norms (Bourdieu, 1983; Coleman, 1988; Putnam, 1993). Many studies have shown that social capital has significant influences on the performance of individuals and groups, leading to mutual obligation, beneficiary support, conflict management, information exchange and resource availability (Hazleton & Kennan, 2000; Lin, 2001). For example, Nahapiet and Ghoshal (1998) as well as Lang (2004) both identify the positive relationships between social capital and the organization's collective knowledge integration, creativity and learning.

In ICT utilization, social capital is viewed as a critical determinant that has a positive influence on ICT users' subjective well-being (Lin, 2001). Clement and Shade (2000) show that obtaining ICT competence involves a social process and needs a supportive learning environment (e.g., workplace, neighborhood, family, or school). In other words, the support and resources derived from social capital can play an important role in the use of ICT. Moreover, the connections among group members in the learning program can affect the participants' obligation and expectation to acquire appropriate resources and support – instrumental as well as emotional. Positive interactions among the program instructor and fellow students facilitate greater goal achievement and high levels of satisfaction among learners (Hong, 2002; Lee & Lee, 2008). These studies, consistent with findings from the TWU program, suggest that a high level of social capital within TWU classes fosters a supportive learning environment for older females to acquire ICT competence (Clement & Shade, 2000). In other words, the social capital within TWU participants may play an important role in their adoption of ICT.

2.2. Computer self-efficacy

Social Cognitive Theory (Bandura, 1986) has been widely studied in various settings such as learning, health promoting behavior, clinical functioning, athletic achievement, and career and occupational development. Within this framework, personal factors such as self-efficacy and anxiety, environmental factors like social norms and peer encouragement, and personal behavior, all operate as interacting