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Computer anxiety and attitudes among undergraduate students in Greece

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ABSTRACT

This study attempts to give an insight to the computer anxiety levels and attitudes toward computers of the students of the Library and Information Systems (LIS) Department of Technological Educational Institute (TEI) of Thessaloniki using Computer Anxiety Rating Scale (CARS) and Computer Attitudes Scale (CAS). Both constructs were examined using explanatory factor analysis. Internal consistency of the factors of each construct was satisfactory. It was found that there was a strong negative relationship between the two concepts. Canonical correlation analysis demonstrated that anxiety explains more variance of the attitudes than vice versa. Another finding was that most of LIS students were not anxious toward computers and with positive attitudes. Factors correlated negatively with anxiety and positively with attitudes, were knowledge of English language, PC ownership, access of students to computers at younger ages, perceived advanced computer skills and computer experience as reflected by frequency of computer use.

1. Introduction

Today, computers permeate nearly every human activity. In addition, information and communication technology has a great potential for education and can transform the teaching and learning process. Liaw (2002) emphasized that "with the enormous advances in communication and computer technology, the educational system urgently needs the application of this technology in order to enhance the quality of teaching and learning" (p. 17). For educators it should not be an issue of whether or not to use information technology in the teaching and learning but when and how to use it. Computer acceptance by students is a critical factor for the successful integration of computer technologies into the curricula. It is necessary to identify the level of students–computer interaction and to track down the causes of the use or misuse of computers. Computer anxiety and attitudes towards computers, two concepts closely related to computer acceptance and consequently to actual computer usage, should be better understood, if new technologies are to be fully exploited by educators. In addition, research on computer anxiety and attitudes, two concepts that have been extensively studied since the advent of computers in the 1980s, are still relevant today. Technological environment is advancing and changing continuously, thus creating new forms of computer anxiety and attitudes. Despite the comprehensive literature that has been produced regarding these issues, further research is needed across cultures.

The present study attempts to give an insight to the computer anxiety levels and attitudes toward computers of the students of the Library and Information Systems (LIS) Department of Technological Educational Institute (TEI) of Thessaloniki, Greece. It examines the relationship between anxiety and attitudes and a number of background characteristics, such as age, gender, computer ownership, computer accessibility and computer experience. Awareness of attitudes towards computers and of the factors affecting them is critical in understanding how LIS students respond to technology and whether computer anxiety results in a cognitive behaviour that prevents them from realizing the usefulness and the potential of technology. Based on the results, the authors make proposals for actions that will mitigate the effects of computer anxiety and negative attitudes towards computers. It is noteworthy that there is no previous study in Greece to discuss computer anxiety and computer attitudes at the same time. This study is significant in that it will add to the literature regarding computer anxiety and computer attitudes of Greek students.

2. Literature review

When users need to interact with computers very often experience mixed feelings such as, fear, stress, resistance to learn to use them and lack of control over their work lives. In other words they are computer anxious. Computer anxiety is real, and how long it persists is a function of the work environment and the training received, rather than a lack of desire (Torkzadeh & Angulo, 1992). These feelings may limit people's abilities to learn using computers. Smith and Caputi (2001) identified that people reporting high

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computer anxiety, experienced fewer enjoyment when thinking about using computers. Computer attitudes are people's feelings about the impact of computers on society and the quality of life, and their understanding of computers (Heinssen, Glass, & Knight, 1987).

There is a growing interest in computer anxiety and computer attitudes and a comprehensive amount of literature has been produced with regard to gender, with contradictory findings. A number of studies found that women were more computer anxious than men (Chou, 2003; Chua, Chen, & Wong, 1999; Durndell & Haag, 2002; Heinssen et al., 1987; Jackson, Ervin, Gardner, & Schmitt, 2001; Tsai, Lin, & Tsai, 2001). However, many others found no significant differences between males and females with regard to computer anxiety (Anderson, 1996; Anthony, Clarke, & Anderson, 2000; Havelka, Beasley, & Broome, 2004; Jackson et al., 2003; McLlroy, Bunting, Tierney, & Gordon, 2001; North & Noyes, 2002; Popovich, Gullekson, Morris, & Morse, 2008; Roussos, 2004; Sam, Othman, & Nordin, 2005; Truell & Meggison, 2003; Yaghi & Abu-Saba, 1998; Yang, Mohamed, & Beyerbach, 1999). Weil and Rosen (1995) examined technological sophistication and the level of technophobia in university students from twenty three countries. They concluded that there was no worldwide consensus on who were more computer anxious – males or females. As for computer attitudes, in some cases it was found that males held more positive attitudes than females (Liaw, 2002; North & Noyes, 2002). Others found that males and females did not differ significantly in their attitudes toward computers (Kesici, Sahin, & Akturk, 2009; Popovich et al., 2008). All the above gendered patterns of attitudes toward computers were influenced by many factors.

Many studies have dealt with the relationships between computer anxiety and attitudes, and have also examined their correlation with a lot of different factors. In a number of studies, the relationship between computer anxiety and computer attitudes was negative (Durndell & Haag, 2002; Popovich et al., 2008; Sam et al., 2005). Igbaria and Chakrabarti (1990) found that computer anxiety played an important mediating role for computer attitudes and that most of the demographic variables influenced attitudes only indirectly, through their effect on computer anxiety. Moreover, both computer anxiety and attitudes had influenced the way students accepted and used computers (AI-Khaldi & AI-Jabri, 1998; Chou & Tsai, 2009; Korobili, Tilikidou, & Delistavrou, 2006; Teo, 2008). Brosnan (1998) examined the relationship between computer anxiety and computer performance using a self-efficacy framework. The results indicated that computer anxiety directly influenced the number of correct responses obtained from databases. Shermis and Lombart's (1998) study suggested that much of what was considered computer anxiety might in fact be a manifestation of test anxiety.

According to AI-Khaldi and AI-Jabri's (1998) survey, the strongest predictor of computer utilization was, computer liking followed by confidence. A variable that appeared to have a strong influence on computer anxiety was computer experience (Anthony et al., 2000; Chang, 2005; Chua et al., 1999; Havelka et al., 2004; Heinssen et al., 1987; Hong & Koh, 2002; Igbaria & Chakrabarti, 1990; Korobili et al., 2006; Liaw, 2002; McLlroy et al., 2001; Roussos, 2004; Tekinarslan, 2008; Truell & Meggison, 2003; Yang et al., 1999). Though, Anderson (1996) concluded that perceived knowledge rather than experience was a predictor of computer anxiety. Other studies found that prior computer experience was not related to positive computer attitudes (McLlroy et al., 2001; Yushau, 2006).

Ease of use, as well perceived usefulness, seemed also to predict attitudes towards computers and the actual use of both WWW and computers (Davis, 1993; Hsu, Wang, & Chiu, 2009; Moon & Kim, 2001; Teo, Lee, & Chai, 2007). Other studies also revealed that user friendly systems and training programmes resulted in reduction of computer anxiety (Igbaria & Chakrabarti, 1990; Zhang, 2005). However, Popovich et al. (2008) found no significant relationship between computer courses and computer attitudes, while Igbaria and Chakrabarti (1990) found an indirect effect of computer courses to computer attitudes.

Interaction with computers was also found to be influenced by personal traits, i.e., locus of control, personality A/B, and self-esteem (Ajayi, Olatokun, & Tiamiyu, 2001), or openness, neuroticism and agreeableness, as well as the lack of flexibility on the part of the user (Anthony et al., 2000; Kurokonda, 2007) and the amount of time spent using computer (Popovich et al., 2008). It was interesting that McLlroy et al. (2001) found that regularity of access to computing facilities outside the university had no relationship to any of the computer anxiety characteristics, while Teo (2008) found that students who owned computer at home reported a lower level of computer anxiety.

It also seemed that computer anxiety levels, attitudes and usage may be affected by participants' cultural environment (Anthony et al., 2000; Li & Kirkup, 2007; Tekinarslan, 2008; Weil & Rosen, 1995). Li and Kirkup (2007) found that British students were more likely to use computers for study purposes than Chinese students, but Chinese students were more self-confident about their advanced computer skills. Yaghi and Abu-Saba (1998), in a study addressed to teachers in Lebanese schools, found that the language of teaching seemed to play a role in computer anxiety. Teachers who taught in French and Arabic seemed to have higher computer anxiety than those who used the English language.

Several instruments have been developed to measure computer anxiety and attitudes (Heinssen et al., 1987; Kay, 1993; Loyd & Loyd, 1985; Macoulides, 1989; Rosen, Sears, & Weil, 1987). Several studies have used a number of scales to assess their psychometric properties (Arigbabu, 2009; Chu & Spires, 1991; Dyck, Gee, & Smither, 1998; Kluever, Lam, Hoffman, Green, & Swearingen, 1994) with mixed and not always clear results (Arigbabu, 2009). Researchers have emphasized the need to clarify the dimensionality of the computer anxiety and attitudes concepts and to evaluate the validity of the instruments (Bandalos & Benson, 1990). In addition, in the view of the constant technological developments, reassessment of existing computer anxiety scales is necessary. There is also a need for cross-cultural examination of the scales, because an instrument developed in one context may not be suitable for another (Hui & Triandis, 1985).

3. Research design

3.1. Research objectives

The purpose of the present research is twofold:

- To explore the relationship between anxiety and attitudes toward computers;
- To assess the effect of certain background characteristics on computer anxiety and attitudes.

Finally, it should be mentioned that in order to accomplish the above objectives the underlying structure of Computer Anxiety Rating Scale (CARS) and Computer Attitudes Scale (CAS) was examined and evidence on their validity was provided.

3.2. Research participants

The participants of the survey were students in the Library and Information Systems (LIS) Department of the Technological Educational Institute of Thessaloniki (TEI), Greece. The LIS student