Presenting a model of predicting computer anxiety in terms of epistemological beliefs and achievement goals

Reza G. Jahromi [a,*], Masoud G. Lavasani [a], Ahmad Rastegar [b], Alireza Mooghali [b]

[a] Faculty of Psychology, University of Tehran, Iran
[b] Central Office, Payame-Noor University, Shiraz, Iran

ARTICLE INFO

ABSTRACT

The aim of this study was to prepare a model for computer anxiety through investigating the relationship of achievement goals and epistemological beliefs with computer anxiety. In order to fulfill this, 375 undergraduate students (218 female and 157 male) from the University of Tehran were chosen through relative class sampling. They completed a questionnaire composed of an achievement goals scale, an epistemological beliefs questionnaire, and a computer anxiety scale. The results showed that mastery and performance-avoidance goals directly and epistemological beliefs indirectly, i.e.; through the mediating role of achievement goals, can significantly ($p < 0.01$) predict computer anxiety.

1. Introduction

Computer has caused a change in society that is comparable to the change brought about by the industrial revolution. Information & Communication Technology is the main distinction of our age compared to the past. In accordance with the new developments in the age of informational technology, educational systems should also adopt some developments so as to find their effective status in sociological developments and improvements. In such an atmosphere, educational systems face two main problems: on the one hand, they should provide the learners with the necessary skills required for living in the age of information, on the other, they should utilize new technologies and tools in providing educational services.

Nevertheless, it is pretty conceivable that computers may cause tension and anxiety in students. In this case, many of them will avoid confronting computers due to the aforementioned anxiety, which will result in being deprived from the contemporary vast world of information, speed and precision in the field of research and educational activities. Therefore, such conditions call for all the people especially university students and the elites to be familiar with computer and working with it and have no anxiety caused by it. In order to obtain such results, it is necessary to recognize, understand and become aware of the phenomenon of computer anxiety and identify the factors influencing it.

In two recent decades, besides the classic psychological concepts of anxiety, like separation anxiety and test anxiety, in motivation framework, a new kind of anxiety has been proposed as social and individual pathology, and theorists in this domain have set out to analyze and interpret this modern pathology of last years of the second millennium, namely computer anxiety.

Golamali Lavasani (2002) assumes that computer anxiety is a kind of emotional and cognitive reaction that occurs while the individual is working and interacting with computer and it happens as a consequence of the lack of awareness and the individual's attitude towards the computer as a threatening object. Since computer anxiety is a response to an external danger or threat, and is not an intrinsic concept or a personality characteristic, we can call it a kind of state anxiety and distinguish it from trait anxiety. We can, therefore, categorize it with other psychological phenomena like mathematics anxiety and test anxiety.

In recent years, achievement goals as one of the most important theoretical frameworks for conceptualizing and investigating the academic outcomes have received much attention. "Achievement goals" stands for a comprehensive semantic system of situations or contexts which have cognitive, emotional, and behavioral outcomes and learners use them to interpret their performances (Ames, 1992; Dweck and Leggett, 1988; Kaplan and Maehr, 1999).

The concept of achievement goals generally denotes the students' reasons for doing tasks (Braten & Stromso, 2004). In other words, concerning this factor, the students respond to this question: "why do I do this task?". This theory, beyond other theories which emphasize cognition or situational factors in order to create motivation, considers both personal (perceptions, values, and emotions) and situational factors (Meece, Blumenfeld, & Hoyl, 1988). Achievement goals depending on the role of the skill or the ability may come in different forms including mastery goals (task-oriented and learning goals) which are used for indicating the improvement in efficiency, learning ability and mastery on tasks,

* Corresponding author. Tel.: +98 9171904652; fax: +98 7913336933.
E-mail address: rezaghorban61@yahoo.com (R.G. Jahromi).

and performance goals (self-oriented and relative ability) are utilized for demonstrating efficiency and competing with others. Recently, Elliot et al. (Elliot & Church, 1997; Elliot & Harachkiewicz, 1996) have extended the achievement goals theory and proposed a three dimensional framework of achievement goals: mastery goals, performance-approach goals, and performance-avoidance goals. According to this view, the students with performance-approach goals assume the activity they do to achieve a goal and demonstrate themselves to others a competition and this appreciation of their own activities raises some emotions inside them that cause them to try harder and have more concentration on tasks and the tasks become more attractive to them. Moreover, those who adopt performance-approach goals tend to emphasize demonstrating their skills in comparison with others. Further, those who adopt performance-avoidance goals concentrate on avoiding lack of skills in comparison with peers and classmates and their attention is on avoiding failure. Finally, the outcome of such a goal setting is feeling inefficient. At last, those who adopt mastery goals insist on elaborating their skills, learning, and mastery.

In the literature, there was not found any research directly addressing the relationship between achievement goals and computer anxiety. But Harrison and Rainer (1992) and Coffin and Macintyre (1999) studied the relationship between the intrinsic motivation or the intrinsic goal orientation (equal to mastery goal orientation in this research) and computer anxiety and showed that the students without a high intrinsic motivation had more computer anxiety. Tanaka, Takehara, and Yamauchi (2006) showed, in their study, that there was a negative relationship between performance-approach goals and state anxiety, whereas the relationship of performance-avoidance goals and state anxiety was positive. Among these, only the latter was significant. On the other hand, Johnson (2005) believes that any mechanism which can reduce computer anxiety should lead to an increase in computer self-efficacy. In his "Empirical Investigation of Sources of Application-Specific Computer-Self-efficacy", Johnson showed that learning (mastery) goal orientation is positively related to computer-self-efficacy. The results of his research showed that computer anxiety is negatively related to computer-self-efficacy. Therefore, with adopting leaning goal orientation by the individual, his or her computer-self-efficacy will increase and his or her computer anxiety will decrease. So, it is expected that learning goal orientation have negative relation with computer anxiety.

Furthermore, some studies have shown that mastery and performance-approach goals are negatively related to test anxiety (Meece et al., 1988; Pintrich & DeGroot, 1990; Skaalvik, 1997). However, Salili, Chiu, and Lai (2002) found that for Chinese students, learning goals were positively related to test anxiety. Dickson and MacLeod (2004) found that anxiety was correlated with an increase in avoidance goals (but not approach goals). They believed that anxiety is predominantly characterized by a goal system that is focused on avoidance.

The findings of Paulsen & Gentry (1995) and also Pintrich, Smith, Garcia, and McKeachie (1991) suggest that there is a correlation between external goal orientation and a high amount of test anxiety. In external goal orientation, just like performance goal orientation, the individual does tasks to achieve external rewards such as receiving others' approval or getting good grades.

In the past few years a lot of researches have been done on metacognition and individuals' beliefs about the nature of knowledge and learning, or epistemological beliefs, have recently been investigated with the assumption that they comprise a part of the underlying mechanism of metacognition (Ryan, 1984; Schoenfeld, 1983; Schommer, 1990; Spiro, Feltovich, & Coulson, 1996). Educational psychologists have viewed epistemological beliefs typically as systems of implicit assumptions and beliefs about the nature of knowledge and its acquisition held by students

(Bruning, Schraw, & Ronning, 1999; Hofer & Pintrich, 1997). In the 1990s, Schommer, 1990, Schommer-Aikins, 2004 moved beyond the traditional unidimensional approaches to the conceptualization and measurement of epistemological beliefs, proposing an expanded view that re-conceptualized the construct as a multidimensional system of beliefs about the nature of knowledge and learning (Paulsen & Feldman, 2005). This multidimensional system comprises beliefs about the structure of knowledge, the stability of knowledge, the speed of knowledge acquisition and the control of knowledge acquisition (Paulsen & Feldman, 2005). These dimensions lay on a continuum with the naïve beliefs on one end and the sophisticated beliefs on the other. Those with naïve beliefs believe that knowledge is simple and attained from an authority, moreover the person has no control on his learning and only intelligent people are able to learn. On the other hand, those with sophisticated beliefs think that knowledge has a complex structure and its information is less stable, the individual himself constructs the meaning and concept, and has control on has learning.

In research literature, no study has directly investigated the relationship between epistemological beliefs and computer anxiety. Since both computer anxiety and test anxiety are kinds of state anxiety, here we will consider those researches which have addressed the relationship between these beliefs and test anxiety.

Paulsen and Feldman (1999a,b) suggested that there is a relationship between believing in the simplicity of knowledge and the self-regulated learning strategies like high levels of test anxiety. Their findings (Paulsen & Feldman, 2005) also indicate that the students who held the belief that the structure of knowledge is simple were more likely to have test anxiety. But unlike the case of the relationship between epistemological beliefs and computer anxiety, many studies have investigated the relationship between epistemological beliefs and achievement goals, while all of them have reported almost identical results. For example, some researchers have considered students' beliefs about knowledge and knowing, or personal epistemologies, as an especially important antecedent of achievement goals (e.g. Hofer & Pintrich, 1997; Hofer & Pintrich, 2002). Braten and Stromso (2004) also showed that the students' beliefs in the stability of knowledge and the acquisition of learning was negatively related to mastery goals and positively related to performance-avoidance goals. Beliefs in the quickness of knowledge acquisition were also positively related to performance-approach goals; the way that, the students who believed learning to occurs quickly or not at all were less likely to adopt mastery goals and more likely to adopt performance-avoidance goals. Those who conceived of knowledge as stable or given were less likely to adopt mastery goals.

Garrett-Ingram (1997) and Neber and Schommer-Aikins (2002) reported that naïve epistemological beliefs were negatively related to mastery goal orientation. The results that Braten and Stromso (2005) achieved in their studies approve this. In their study about the relations among epistemological beliefs, implicit theories of intelligence and self-regulated learning, they found out that the naïve epistemological beliefs were negatively related to adaptive motivational beliefs such as self-efficacy and mastery goal orientation.

In another study, university students' beliefs in quick learning and fixed ability were negatively related to the internal (mastery) goals. Moreover, students' beliefs in the simplicity of knowledge were positively related to the external (performance) goals and negatively related to the internal (mastery) goals (Paulsen & Feldman, 1999b). Hofer (1999) also found that the less the students believe that mathematics is an isolated activity, the more they are likely to have internal goal orientation.

Paulsen and Feldman (2005) in their study on "The Conditional and Interaction Effects of Epistemological Beliefs on the Self-regulated Learning of College Students: Motivational Strategies"