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 an action in order to recognize and 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, & Hoyle, 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,

Keywords:
Achievement goals
Epistemological beliefs
Model of computer anxiety

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.

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

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Epistemological beliefs

A B S T R A C T

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.

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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 & Harackiewicz, 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 knowledge 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.
achieved similar findings. Their results showed that the more the students believe in this naïve belief that learning ability is fixed, the less they are likely to maintain an intrinsic (mastery) goal orientation and an extrinsic (performance) goal orientation.

Also, the more the students believe in the naïve belief that the structure of knowledge is simple, i.e. comprised of facts in the form of isolated bits and pieces of information, the less they are likely to maintain an intrinsic goal orientation. Further, the students believing in the simplicity of knowledge were more likely to maintain an extrinsic goal orientation and to experience test anxiety.

The students with the more sophisticated belief that their ability to learn can be improved or enhanced through effort and experience over time, were more likely to maintain both intrinsic and extrinsic goal orientations, in comparison with their peers. In addition, the students with the more sophisticated belief that the structure of knowledge is based on complex relationships between many concepts and ideas, in comparison to their peers, were more likely to maintain intrinsic goal orientations and less likely to experience test anxiety and maintain extrinsic goal orientations.

Schutz, Pintrich, and Young (1993) found that students holding the naïve belief in the certainty of knowledge or the “absoluteness” belief were less likely to adopt an intrinsic goal orientation. Paulsen and Feldman (1999a,b) also showed that there was a relationship between the belief in the simplicity of knowledge and self-regulated learning strategies such as high levels of test anxiety.

With regard to the things mentioned so far, the aim of the present research is to study the role of achievement goals in the relationship between epistemological beliefs and computer anxiety. To do this, based upon the theoretical and empirical literature, a conceptual model (input) was adopted and tested by means of the path analysis.

2. Method

2.1. Participants

The sample consisted of 375 Iranian undergraduate students from 15 colleges of University of Tehran. Participants were 157 males and 218 females, with the average age of 21, ranging from 19 to 31 years old.

2.2. Measures

Participants completed a 107-item questionnaire developed to measure the constructs indicated in Fig. 1. Computer anxiety was measured by using the Beckers and Schmidt Computer Anxiety Scale (BSCAS). The scale measures six factors:

1. Computer literacy (in terms of acquired computer skills),
2. Self-efficacy (confidence in one's capacity to learn how to use computers),
3. Physical arousal in the presence of computers (such as sweaty palms, shortness of breath),
4. Affective feelings toward computers (like or dislike computers),
5. Positive beliefs about the benefits of using computers for society, and
6. Negative beliefs about the dehumanizing impact of computers (Beckers & Schmidt, 2001).

The scale contains 32 Likert-type items, consisting of statements on computers that could be scored between 1 (entirely disagreed) and 5 (entirely agreed) (χ = .71).

Achievement goals were measured by using the Achievement Goal Scale developed by Middleton and Midgley (1997). The scale measures three kinds of goals: mastery, performance-approach and performance-avoidance goals. The achievement goals scale was adapted from Middleton and Midgley (1997) and included three subscales, with four items assessing mastery goals (χ = .83), five items measuring performance-approach (χ = .92), and three items measuring performance-avoidance goals (χ = .85).

To assess students’ epistemological beliefs, the Schommer Epistemological Beliefs Questionnaire (SEQ) (Schommer, 1992) was used. The questionnaire was composed of 63 statements about knowledge and knowledge acquisition and students were asked to rate them on a 5-point likert scale (1, strongly disagree and 5, strongly agree). The four-factor structure found by Schommer, 1990; Schommer, Crouse, & Rhodes, 1992) including simple knowledge, certain knowledge, quick learning, and fixed ability is based on the factor analyses where the subsets of 63 items have been used as variables rather than the individual items (Braten & Stromso, 2004). In factor analysis of this questionnaire in our study, many items were deleted. Finally, 5 items were achieved for each factor. Results from factor analysis confirmed this four-factor structure, but with fewer items. The reliability coefficient (Chronbach χ) for these four factors were .83, .73, .82, and .52 respectively. All items were translated into Persian by two bilingual Ph.D. students majoring in teaching English. Then they were checked by another bilingual.

To determine the construct validity of the variables, factor analysis was used. In the Table 1 (below), the fit indices of variables have been presented.

2.3. Procedure

The questionnaire was administered collectively at the beginning of the academic year. All participants were volunteers.

3. Results

3.1. Descriptive statistics and preliminary analysis

Before examining the relations between variables and testing the conceptual model, a more detailed description of our sample will be presented. The mean, standard deviation, possible range, and Cronbach’s χ reliability coefficient for each subscale are shown in Table 2.

Reliability coefficients for the epistemological beliefs scales ranged from 0.52 to 0.83. Although 0.52 was low by most standards for good reliability, researchers working on the measurement of the epistemological constructs have found coefficient alphas in the 0.50–0.60 range (e.g., Hofer, 2000; Schraw, Bendixen, & Dunkle, 2002). Alpha coefficients for the five epistemological beliefs variables ranged from 0.68 to 0.83 and for the computer anxiety was .71.

Performance-approach goals were more likely to be adopted (M = 13.34), followed by mastery goals (M = 11.42), whereas performance-avoidance goals were less likely to be adopted by students (M = 6.03). Among epistemological beliefs, students endorsed strongly simple knowledge, certain knowledge, quick learning, and fixed ability respectively. The average computer anxiety score was 8.37, while the range of a score one could get in this variable is from 0 to 24.

3.2. Correlation analysis

Relations between variables were examined with zero-order correlations for all variables (Table 3).

As it can be seen, performance-avoidance goals, mastery goals, certain knowledge, fixed ability, quick learning, performance-approach goals, and simple knowledge had respectively the most...
correlation coefficients with computer anxiety. As it was expected, performance-avoidance goals were positively correlated with computer anxiety and certain knowledge. Mastery goals were negatively correlated with computer anxiety and fixed ability. It also showed a negative, but moderate, correlation with quick learning.

3.3. Path analysis

In order to test the theoretical path model presented in Fig. 1, we applied the path analysis. So, in Table 4, direct, indirect and total effects of variables will be presented along with their meaningful levels.

As can be seen, none of the exogenous variables (i.e., epistemological beliefs) have direct effects on computer anxiety, whereas the indirect effect of fixed ability on computer anxiety (0.11) is meaningful at the level 0.01 and is done through mastery goals. It can, therefore, be said that mastery goals play a mediating role between belief in fixed ability and computer anxiety. The indirect effect of quick learning on computer anxiety (0.08) is meaningful at the level 0.01 and is done through performance-avoidance goals. On this basis, we can say that performance-avoidance goals have a mediating role between beliefs in quick learning and computer anxiety. Furthermore, the indirect effect of certain knowledge on computer anxiety (0.16) is meaningful at the level 0.01 and is done through mastery and performance-avoidance goals. So it is concluded that mastery and performance-avoidance goals play a mediating role between beliefs in certain knowledge and computer anxiety. Regarding the meaningful direct effect of performance-approach goals on computer anxiety (−0.04), we conclude that these kinds of goals don't play any mediating role between epistemological

Performance-approach goals were related negatively to fixed ability and had moderate correlation with computer anxiety.

Table 1
Fit indices of variables.

<table>
<thead>
<tr>
<th>Fit indices</th>
<th>Epistemological beliefs</th>
<th>Achievement goals</th>
<th>Computer anxiety</th>
</tr>
</thead>
<tbody>
<tr>
<td>x2/df</td>
<td>2.78</td>
<td>1.42</td>
<td>2.43</td>
</tr>
<tr>
<td>RMSEA</td>
<td>.048</td>
<td>.03</td>
<td>.005</td>
</tr>
<tr>
<td>GFI</td>
<td>.96</td>
<td>.99</td>
<td>.91</td>
</tr>
<tr>
<td>AGFI</td>
<td>.94</td>
<td>.97</td>
<td>.90</td>
</tr>
</tbody>
</table>

Table 2
Means, standard deviations, and Cronbach’s alphas of the variables in the study.

<table>
<thead>
<tr>
<th>No.</th>
<th>Variable</th>
<th>Possible range</th>
<th>Mean</th>
<th>SD</th>
<th>α</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Fixed ability</td>
<td>1–5</td>
<td>10.34</td>
<td>2.66</td>
<td>.52</td>
</tr>
<tr>
<td>2</td>
<td>Simple knowledge</td>
<td>1–5</td>
<td>13.23</td>
<td>4.04</td>
<td>.83</td>
</tr>
<tr>
<td>3</td>
<td>Quick learning</td>
<td>1–5</td>
<td>11.90</td>
<td>3.71</td>
<td>.82</td>
</tr>
<tr>
<td>4</td>
<td>Certain knowledge</td>
<td>1–5</td>
<td>13.20</td>
<td>3.22</td>
<td>.83</td>
</tr>
<tr>
<td>5</td>
<td>Mastery goals</td>
<td>1–5</td>
<td>11.42</td>
<td>2.64</td>
<td>.68</td>
</tr>
<tr>
<td>6</td>
<td>Performance-approach</td>
<td>1–5</td>
<td>13.34</td>
<td>3.17</td>
<td>.57</td>
</tr>
<tr>
<td>7</td>
<td>Performance-avoidance</td>
<td>1–5</td>
<td>6.03</td>
<td>2.10</td>
<td>.32</td>
</tr>
<tr>
<td>8</td>
<td>Computer anxiety</td>
<td>1–5</td>
<td>8.37</td>
<td>2.22</td>
<td>.71</td>
</tr>
</tbody>
</table>

Table 3
The correlations among variables involved in the model (N = 375).

<table>
<thead>
<tr>
<th>No.</th>
<th>Variables</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>7</th>
<th>8</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Fixed ability</td>
<td>−0.07</td>
<td>−</td>
<td>−</td>
<td>−</td>
<td>−</td>
<td>−</td>
<td>−</td>
<td>−</td>
</tr>
<tr>
<td>2</td>
<td>Simple knowledge</td>
<td>0.03</td>
<td>0.21**</td>
<td>−</td>
<td>−</td>
<td>−</td>
<td>−</td>
<td>−</td>
<td>−</td>
</tr>
<tr>
<td>3</td>
<td>Quick learning</td>
<td>−0.10</td>
<td>−0.03</td>
<td>0.05</td>
<td>−</td>
<td>−</td>
<td>−</td>
<td>−</td>
<td>−</td>
</tr>
<tr>
<td>4</td>
<td>Certain knowledge</td>
<td>0.01</td>
<td>−0.02</td>
<td>0.12*</td>
<td>0.27**</td>
<td>−</td>
<td>−</td>
<td>−</td>
<td>−</td>
</tr>
<tr>
<td>5</td>
<td>Performance-avoidance</td>
<td>−0.24***</td>
<td>−0.07</td>
<td>−0.12*</td>
<td>−0.09</td>
<td>−0.19**</td>
<td>−</td>
<td>−</td>
<td>−</td>
</tr>
<tr>
<td>6</td>
<td>Mastery goals</td>
<td>0.15**</td>
<td>0.06</td>
<td>0.09</td>
<td>0.06</td>
<td>−0.02</td>
<td>0.14**</td>
<td>−</td>
<td>−</td>
</tr>
<tr>
<td>7</td>
<td>Performance-approach</td>
<td>0.17**</td>
<td>0.05</td>
<td>0.15**</td>
<td>0.22**</td>
<td>0.51**</td>
<td>−0.51**</td>
<td>−0.10*</td>
<td>−</td>
</tr>
</tbody>
</table>

*, p < 0.05.
**, p < 0.01.
beliefs and computer anxiety (this is depicted in Fig. 2). Among endogenous variables, mastery and performance-avoidance goals have the most direct effects (−0.44 and 0.44) on computer anxiety, being both meaningful at level 0.01. Further, having compared the conceptual model with the output model and with regard to the fact that the direct and indirect effect coefficients of beliefs in simple knowledge on achievements goals and computer anxiety were not meaningful, the deletion of this belief (in Fig. 2, the output model) is evident. Moreover, the explained amount of the variance of computer anxiety is 40%.

Now with regard to the parameters presented in Table 4, the fitted model of computer anxiety accompanied by its fit indices is being exhibited.

In Table 5, the fit indices of predicting computer anxiety model are presented.

We assessed the overall fit of the model according to several indices: the goodness-of fit index (GFI), adjusted goodness-of-fit index (AGFI), comparative fit index (CFI), and root mean square error of approximation (RMSEA). Generally speaking, GFI and AGFI values above .90 (Kline, 2005) and RMSEA values less than .06 (Tabachnick & Fidell, 2001) are indicative of optimal model fit. RMSEA values at or above 1.0 reflect a poor fitting model (Tabachnick & Fidell, 2001). Values of $\chi^2$/df that fall below 5.00 (Marsh & Hocevar, 1985) and CFI above .90 (Bentler, 1990) are indicative of good fit. Taken together, these statistics indicate a fairly reasonable fit of the measurement model to the data.

4. Discussion

This study was conducted with the aim of investigating the relationship between epistemological beliefs and computer anxiety with regard to the mediating role of achievement goals. To

Table 4

<table>
<thead>
<tr>
<th>Predictor</th>
<th>Criterion</th>
<th>Direct effect</th>
<th>Indirect effect</th>
<th>Total effect</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fixed ability</td>
<td>Performance-approach goals</td>
<td>−0.25**</td>
<td>−</td>
<td>−0.25**</td>
</tr>
<tr>
<td>Quick learning</td>
<td></td>
<td>0.10**</td>
<td>−</td>
<td>0.10**</td>
</tr>
<tr>
<td>Fixed ability</td>
<td>Mastery goals</td>
<td>−0.24**</td>
<td>−</td>
<td>−0.24**</td>
</tr>
<tr>
<td>Simple knowledge</td>
<td></td>
<td>−0.07</td>
<td>−</td>
<td>−0.07</td>
</tr>
<tr>
<td>Quick learning</td>
<td></td>
<td>−0.09</td>
<td>−</td>
<td>−0.09</td>
</tr>
<tr>
<td>Certain knowledge</td>
<td></td>
<td>−0.11</td>
<td>−</td>
<td>−0.11</td>
</tr>
<tr>
<td>Simple knowledge</td>
<td>Performance-avoidance goals</td>
<td>−0.03</td>
<td>−</td>
<td>−0.03</td>
</tr>
<tr>
<td>Quick learning</td>
<td></td>
<td>0.11**</td>
<td>−</td>
<td>0.11**</td>
</tr>
<tr>
<td>Certain knowledge</td>
<td></td>
<td>0.26**</td>
<td>−</td>
<td>0.26**</td>
</tr>
<tr>
<td>Mastery goals</td>
<td>Computer anxiety</td>
<td>−0.44**</td>
<td>−</td>
<td>−0.44**</td>
</tr>
<tr>
<td>Performance-approach goals</td>
<td></td>
<td>−0.04</td>
<td>−</td>
<td>−0.04</td>
</tr>
<tr>
<td>Performance-avoidance goals</td>
<td></td>
<td>0.44**</td>
<td>−</td>
<td>0.44**</td>
</tr>
<tr>
<td>Fixed ability</td>
<td></td>
<td>−</td>
<td>0.11**</td>
<td>0.11**</td>
</tr>
<tr>
<td>Simple knowledge</td>
<td></td>
<td>0.03</td>
<td>0.02</td>
<td>0.02</td>
</tr>
<tr>
<td>Quick learning</td>
<td></td>
<td>−</td>
<td>0.08**</td>
<td>0.08**</td>
</tr>
<tr>
<td>Certain knowledge</td>
<td></td>
<td>−</td>
<td>0.16**</td>
<td>0.16**</td>
</tr>
</tbody>
</table>

* p < 0.05, ** p < 0.01.

Table 5

<table>
<thead>
<tr>
<th>x2/df</th>
<th>RMSEA</th>
<th>GFI</th>
<th>AGFI</th>
<th>CFI</th>
</tr>
</thead>
<tbody>
<tr>
<td>2.75</td>
<td>0.054</td>
<td>0.98</td>
<td>0.94</td>
<td>0.96</td>
</tr>
</tbody>
</table>

Fig. 2. The fitted model of predicting computer anxiety, depicting the relations between epistemological beliefs, achievement goals, and computer anxiety.
achieve this goal, by the help of Dweck's cognitive social approach and theoretical and empirical research backgrounds, a conceptual model was proposed and tested by means of path analysis. Its results showed that the proposed model fits the data relatively well and accounted for 40% of the computer anxiety variance.

The meaningfulness of the direct and negative effect of mastery goals on computer anxiety shows that concentrating on diligence and acceptance of mistakes as a component of learning, creating and improving new skills, developing an exact understanding of the issues, mastering the tasks, the intrinsic value of learning and paying attention to the process of learning, will probably cause students to experience less computer anxiety. This finding is in line with the results of some researchers such as Johnson (2005), Harrison et al. (1992), Coffin and MacIntyre (1999), Meee et al. (1988), Pintrich and DeGroot (1990), and Skaalvik (1997). Harrison et al. (1992) and Coffin and MacIntyre (1999) showed that the students without a high intrinsic motivation (equal to mastery goal orientation) had more computer anxiety.

The meaningfulness of the direct and positive effects of performance-avoidance goals on computer anxiety also shows that preventing lack of skill in comparison with peers and classmates and tendency to avoid failure can play an important role in increasing the amount of students' computer anxiety. Such people are more probable to try to attract positive judgments from others and prove themselves intelligent just to avoid failure. This finding is in line with the results of the researches of Tanaka et al. (2006), Skaalvik (1997), and Dickson and MacLeod (2004). Dickson and MacLeod (2004) believed that anxiety is predominantly characterized by a goal system that is focused on avoidance.

Regarding the relationship between performance-approach goals and computer anxiety, our result is in line with the findings of Dickson and MacLeod (2004). They found out that computer anxiety has no correlation with performance-approach goals. However, this finding is not in line with the results of some researchers such as Tanaka et al. (2006), Meee et al. (1988), Pintrich and DeGroot (1990), and Skaalvik (1997). It seems that this contradiction is because of the dependency of these variables to time, environment, and cultural factors. Meanwhile, in this regard it is worthy of attention that Midgeley, Kaplan, and Middleton (2001) believe that performance-approach goals are influenced by the nature of learning products, characteristics of individuals and environmental conditions. Therefore, the mentioned contradiction may be due to using different instruments, age groups or educational settings. Success in university, for example, may need more efforts than in school.

On the one hand, with regard to the fact that the direct effects of epistemological beliefs on computer anxiety were not meaningful and the direct effects of the beliefs dimensions on achievement goals and achievement goals on computer anxiety were meaningful, on the other, we may infer that the achievement goals have a mediating role in the relationship between epistemological beliefs and computer anxiety.

Regarding the role of mastery goals in decreasing [the amount of] computer anxiety, the experts in educational fields and families should recognize and consider the factors which lead to the adoption of mastery goals by students. Moreover, according to the study of Elliot and Dweck (1988), if schools, universities, and other educational institutions' evaluation criteria become criterion-centered, the ground for adopting the mastery goals may be prepared. Correspondingly, according to Roser, Midgeley, and Urden (1996), if learning materials are set to be applicable and the students develop the attitude that schools and universities increase the individual's social responsibility and understanding of the universe, it is probable that the ground for adopting the mastery goals by students will be provided.

On the other hand, regarding the negative and harmful outcomes of performance-avoidance goals which cause an increase in computer anxiety of students, the structure of educational environments should be designed so as to prevent the formation of these goals in students. Moreover, considering the relation of epistemological beliefs dimensions and achievement goals and also regarding the findings of Braten and Stromso (2005), Paulsen and Feldman (2005) and Hofer and Pintrich (2002, 1997), it would be better to push the students to hold wise and sophisticated beliefs which, in turn, may set forth the grounds for decreasing computer anxiety. Meanwhile, with regard to the role of parents and teachers' attitudes and expectancies in creation of students' thought frames, it is suggested that these people be aware of the outcomes of having such beliefs in adopting goal orientations from students. Finally, the results of this study show that only 40% of variance is explained in the fitted model; it implies the role of other variables causing computer anxiety which were not studied in our research. So, it may be a fruitful proposal for the other researchers to pay more attention to the role of other variables especially the ones concerning personality.

References


