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Relationship Between EFL Learners' Computer Anxiety and Their Preferred Feedback Method(s) in Writing

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Abstract

This study examined the relationship between EFL students' level of computer anxiety and the feedback method(s) they selected during the revision process of a writing assignment, as well as the effect of the feedback method(s) students chose on their writing performance. The participants of the present study were 120 EFL university students chosen out of 145 students based on their PET language proficiency test scores. In the next step, a 19-item translated version of Computer Anxiety Rating Scale (CARS) was administered to all of the 120 students in order to measure the students' level of computer anxiety. Afterwards, the researcher asked the students to specify the feedback method(s) they preferred. The feedback methods included online direct feedback, online indirect feedback, and face to face feedback. They were divided into four experimental groups based on their choice of feedback method(s). During a five-week course of intervention, the participants wrote five essays, one in each session, and received comments in respect with their preferred feedback. The first draft and last draft of their writing were used as the homogenizing pretest and posttest respectively. The results of chi square analysis revealed that the level of computer anxiety was related to the choice of feedback method(s). Moreover, the Kruskal Wallis test indicated that there was no significant difference among the four feedback groups regarding their writing performance.

Keywords: Computer anxiety, Feedback, Face-to-face feedback, Online direct feedback, Online indirect feedback.

Introduction

Over the past several decades, computers and related technologies have become well-integrated into society. Increasingly, more people are utilizing computers and computer software daily for recreational, educational, and vocational purposes, and understanding how to use computers has become a basic and seemingly required skill. Perhaps one area of society that is significantly influenced by computer technology is education, particularly as educational systems further recognize the need for students to be computer literate to achieve success in a technologically-advanced workforce. Although this push is now beginning early in children's educational careers, it is important to consider how undergraduate college students, who may or may not have been introduced to computers in primary or secondary education, are influenced by computer technology. So the connection between language education and computer technology grows stronger every year. More and more educational institutions are adopting programs that make extensive use of language learning software, online interaction tools, and course delivery systems (Blake, 1998; Chapelle, 2001). Online communication tools have been recently employed by more and more foreign language teaching communities.

It is important to note, however, that the incorporation of computer technology into the classroom has also been accompanied by an increasing number of students who experience anxiety when interacting with computers or when thinking about the possibility of using computers (Glass & Knight, 1988; Heinssen, 1987; Rosen, 1992).

One type of anxiety is computer anxiety, and it is defined by Howard and Smith (1986) as the "fear of impending interaction with a computer that is disproportionate to the actual threat presented by the computer". Computer anxiety is a concept

of a specific anxiety type; that regularly occurs in a specific type of situation (Bailey, 1983). For example, many of the students experience some level of anxiety especially when they first encounter computer technology; this might cause them to avoid using computer partially or completely. In order to understand causes of computer anxiety, researchers (Al Jabri, 1996; Stone, 1996) have identified several correlates; math anxiety, gender, trait anxiety, knowledge of computers, and cognitive and thinking style. To date, little research has been done to determine the effects this computer anxiety has on language-learning processes and outcomes, for example feedback. Feedback may be even more important in online environments than in traditional classrooms (Lynch, 2002; Palloff, 2001). That is, due to a lack of feedback, students in online courses are more likely to disconnect from the material or environment than students attending face-to-face courses (Ko & Rosen, 2001).

There are different types of feedback methods: teacher written feedback, self-monitoring, peer feedback, face to face feedback, computer-mediated feedback, and online feedback (online direct feedback and online indirect feedback), etc. In this study, online direct feedback, online indirect feedback, and face-to-face feedback were considered. Although in the field of educational psychology there have been studies of the relationship between students' varying levels of computer anxiety and their academic performance (Mahar, 1997; Rozell, 1999), few studies (Bloom, 1990; Ittzes, 1997) have investigated this relationship in the context of computer-mediated foreign language writing. Therefore, the purpose of the present study was to investigate whether there is any statistically significant relationship between EFL students' level of computer anxiety and the feedback method(s) they select during the revision process of a writing assignment, as well as whether there is any statistically significant difference between the writing performance of EFL students based on the feedback method(s) they choose.

To fulfill the purpose of this study, the following research questions were addressed.

1. Is there any significant relationship between EFL students' level of computer anxiety and the feedback method(s) they select during the revision stage of a writing assignment?
2. Is there any significant difference between the writing performance of EFL students based on the method(s) they choose?

In order to investigate the research questions, the following null hypotheses were proposed:

H01: There is no significant relationship between EFL students' level of computer anxiety and the feedback method(s) they select during the revision stage of a writing assignment.

H02: There is no significant difference between the writing performance of EFL students based on the feedback method(s) they choose.

Literature review

Computer anxiety can, on the most basic level, be referred to negative emotions and cognitions evoked in actual or imaginary interaction with computer-based technology. It has the nature of a trait that predisposes towards the state of psychological distress in situations that involve encounters with computers (Deane, 1995).

Given the obvious need to possess computer skills and the potential impact on those individuals who fall through the cracks, it is no wonder that the study of computer anxiety has received considerable attention by researchers (Rosen, 1993; Howard, 1986). Indeed, a simple search of the ERIC database using the descriptor "computer anxiety" revealed studies of the topic nearly 30 years ago (Powers, 1973). In a more recent study, Anderson (1995) examined the computer experience, perceived knowledge of software, overall knowledge of computers, programming experience, and gender on computer anxiety and performance unit in information systems. As noted by Anderson, perceived knowledge rather than computer experience was found to be a significant predictor of computer anxiety. Further, Marcoulides (1987) reported that computer anxiety is a good predictor of computer achievement in college students taking computer classes.

The role of feedback in learning

Feedback as defined by Furnborough and Truman (2009) entails the existing gaps between what has been learned and the target competence of the learners, and the efforts undertaken to bridge these gaps. This feedback is provided to ask for further information, to give directions, suggestions, or requests for revision, to give students new information that will help them revise, and to give positive feedback about what the students have done well (Ferris, 1997).

If feedback is to lead to improved performance, we need to engage students in the process so that we are able to understand and respond to their needs. This is of particular importance when we are talking about instruction in an online environment because the dynamics of the territory are not the same as in a traditional classroom. The lack of face-to-face interaction in an online class makes providing feedback especially important. Online learners consistently report that the lack of direct contact makes it difficult to form satisfying interpersonal relationships with the instructor and the other students. Without this connection and sense of community, feelings of isolation take over, resulting in decreased motivation and learning (Mullen, 2006; Song, 2004).

Approaches to online feedback for writing assignments

The development of effective writing skills is viewed as a central component of the educational process in our culture (Mory, 2001) and most online classes are heavily oriented toward written assignments (Wingfield, 1975). Because of this, many instructors put a great deal of effort into providing feedback on student writing (Sellani, 2002), but it is often not well received or acted upon by students (Fritz, 2000). Typically, feedback on written assignments in an online class takes one of three formats: a summary grade with no comments, a summary grade with general comments typed at the end of the essay—possibly with a few specific examples copied and pasted from the essay for clarification, or, an overall grade with editing and comments added into the body of the paper through the use of such tools as Microsoft Word's "track changes" or "insert comments" (Wingfield, 1975).

Given what researchers (Cardelle, 1981; Watkins, 2000) know about providing quality feedback, the "grade only" response is clearly of limited value. Although the "summary comments" method may be a better alternative, it has the potential to be ambiguous and lacks the visual impact of the traditional "pen in hand" approach that is standard when commenting on hardcopies of student papers. The track changes or insert comments features more closely resemble "pen in hand" in terms of being able to highlight problematic areas, but they are not as flexible, can be difficult for inexperienced students to use, and again lack the visual aspect of traditional notations such as drawing circles and arrows.

The potential importance of this visual element should not be ignored. Research suggests that students may have distinct learning styles—or preferences (Felder, 2005) for "the manner in which, and the conditions under which, …[they] most efficiently and effectively perceive, process, store, and recall what they are attempting to learn" (Wehrwein, 2006). Among the various styles suggested is a distinction in preference for receiving information in a visual (e.g., drawings and diagrams) or verbal (e.g., spoken or written words) format (Felder, 2005). Many students, including second language learners (Park, 2002); have been shown to favor visual input. Given the relatively common orientation to verbal presentations for instruction, numerous researchers have called for the inclusion of both forms whenever possible so that the needs of all learners are more likely to be addressed (Felder, 2005; Wehrwein, 2006).

Research into teacher feedback on student writing

Investigations into teacher feedback have included studies examining the effectiveness of teacher feedback (Zamel, 1985; Truscott, 1996) and examining student preferences and reactions towards teacher feedback (Hedgcock, 1994 & 1996; Leki, 1991). There are also studies examining the effectiveness of teacher feedback through the comparison of peer feedback (Connor, 1994; Zhang, 1995). In Zhang's (1995) study, students highly valued their teacher's feedback and corrections. Leki's (1991) study also demonstrated that students found error feedback very important and they demanded to have their errors corrected by their teachers. However, Truscott (1996) proposed that error correction should be abandoned. He argued that direct correction is not useful for students' development in accuracy and that grammar correction would bring about harmful effects on both teachers and students.

Efficacy of peer feedback in nliOne learning environments

Peer feedback, also referred to as peer response, peer editing and peer review, is another type of feedback recommended frequently by process advocates. It remains a popular source of feedback in the ESL/EFL classroom. The use of peer feedback as an instructional strategy in an online learning environment offers a number of distinct advantages including: increasing the timeliness of feedback, providing new learning opportunities for both givers and receivers of feedback, humanizing the environment, and building community (Corgan, 2004). By asking students to provide constructive feedback to each other, they participate in each other's learning and thus achieve greater understanding and appreciation for their peers' experiences and perspectives.

Although peer feedback can add value to both the instructional and learning process, it is not without its challenges. These challenges include overcoming students' anxiety about giving and receiving feedback (especially negative feedback), and ensuring reliability. Tunison and Noonan (2001) reported that many students found it difficult to communicate complex ideas in an online environment, and that their ability to express their questions clearly and comprehend detailed explanations was limited by the lack of face-to-face interaction.

Arbaugh (2000) reported that while student participation in online course discussions tends to be more equal and at a higher level than in traditional settings, this interaction may not be as effective as face-to-face interaction-at least not until participants achieve a level of comfort with each other. If peer feedback is to benefit all members of the learning community, these are issues that must be addressed (Preece, 2001).

Methodology

Participants

The participants of the present study were 120 undergraduate male (52) and female (68) EFL students with the age range between 21 to 25 out of 145 students from two Islamic Azad Universities including Gorgan and Aliabad Katoul branches. They were all senior students since they had to have passed the writing courses 1 and 2, and also advanced writing. The reason for this was to ensure that they had enough knowledge and background for writing a five paragraph essay. They varied in computer experience. Some students had considerable experience using computers and software applications for conferencing online, making presentations, and writing reports, whereas others were technologically less experienced to the extent that they preferred to write a term paper by hand rather than on a computer. A number of 30 students with similar characteristics to that of the target sample were used for piloting the test of PET used to homogenize the participants of the study.

Instrumentation

The instruments that were utilized in this study were Preliminary English Test (PET), a translated version of computer anxiety questionnaire, a formal essay-writing task, and a rating scale.

a. Preliminary English Test (PET)

The present study was conducted with 120 EFL university students chosen out of 145 students based on their language proficiency test scores. A 67-item standard PET test, released by Cambridge ESOL exam (copy right 2004), was administered to measure the participants' general English proficiency level. The proficiency test PET (Preliminary English Test, 2004) is a second level Cambridge ESOL exam for the intermediate level learners. The test consisted of three sections since the researcher could not conduct the speaking section due to practicality issues.

b. Computer Anxiety Questionnaire

A translated version of Computer Anxiety Rating Scale (CARS) developed by Heinssen, Glass, and Knight (1987) was used to measure students' level of computer anxiety. This questionnaire was translated by two experienced translators. CARS consists of 19 items and is scored from 1-6 with "1" indicating a response of "strongly disagree" to "6" indicating a response of "strongly agree". The participants were grouped into three levels of computer anxiety: no anxiety (29-57), low anxiety (58-86), and moderate/ high anxiety (87-114). The minimum and maximum scores ranged from 19-114.

c. Formal Essay-Writing Task

The participants wrote a formal essay using the standard five-paragraph format: An introductory paragraph, three body paragraphs, and a concluding paragraph.

Overall, the students were to write five drafts: The first draft was used as a pretest to homogenize the participants in each feedback group according to their essay writing performance, and on the following three drafts, the students received the instructor's comments based on their preferred feedback method(s), then they revised their drafts by using this information and submitted them to the instructor. Also, the last draft was used as the posttest to evaluate the writing performance of the participants in the experimental groups.

d. Rating Scale

An analytic rating scale by Weir (cited in Weigle, 2002, p. 117) comprising seven aspects of writing including relevance and adequacy of content, cohesion, compositional organization, adequacy of vocabulary for purpose, grammar, mechanical accuracy (including punctuation and spelling) was used for the purpose of rating the participants' performance on the two drafts of essay-writing task. The band scores for each of these aspects of writing was 0-3.

Procedure

In order to answer the research questions, the following procedure was pursued.

Initially, in order to check the reliability of the Preliminary English Test (PET), it was piloted among 30 participants of similar characteristics to the target participants of the study. The result showed that it had a reliability of .91.Then, in order to have a homogeneous group of participants, this version of Preliminary English Test (PET) was administered to all the 145 senior students who had passed writing courses 1 and 2, and also advanced writing at that university and merely those students whose scores were one standard deviation above and below the mean of the normal distribution curve were chosen for the study. Accordingly, 120 learners constituted the participants in the research. Then, a 19-item translated version of Computer Anxiety Rating Scale was administered to all of the 120 students in order to measure students' level of computer anxiety.

In addition to completing computer anxiety questionnaire, all students wrote a formal essay using the standard five-paragraph format: An introductory paragraph, three body paragraphs, and a concluding paragraph. In fact, The students were to write five drafts: The first draft was used as a pretest to homogenize the participants in each feedback group according to their essay writing performance, and on the following three drafts, the students received the instructor's comments based on their preferred feedback method(s), then they revised their drafts by using this information and submitted them to the instructor. Also, the last draft was used as the posttest to evaluate the writing performance of the participants in the experimental groups.

The students had several feedback options for their initial drafts. A first option was to post their drafts to the online class bulletin board for direct feedback from their teacher and classmates. The instructor would read the draft, indicate errors by offsetting them with slashes (e.g., John and Dave/ lives/ in Tokyo), make some comments about other aspects of writing (e.g., logical sequence), and repost the draft to the forum. The students who posted their drafts online could understand how the sentences were flawed, make corrections, and submit the corrected draft or part of the corrected draft to the forum again. They could also post questions seeking instructor and classmate feedback. No constraint was placed on the number of postings, and the students could post their drafts and questions to the forum as often as they liked.

A second option was to receive indirect feedback on their drafts by looking at the drafts of other students and reading the teacher's suggestions posted on the bulletin board. Because students who refrained from posting their drafts to the forum could also read and critique the posted essays alongside the instructor's suggestions, they could incorporate necessary changes into their own drafts. It should be noted, however, that there was a risk of students misunderstanding or overgeneralizing the teacher's suggestions made on the drafts of others and incorporating unnecessary changes into their drafts. No constraint was placed on the number of logins to the bulletin board.

A third option was to visit the instructor for face-to-face feedback and discussion. Students who chose this option were able to receive direct feedback on their own drafts. Although the students could visit their instructor as often as they liked, they

needed to make an appointment in advance. In this sense, unlike the online feedback options that were available anytime, the face-to-face feedback option was provided only when the instructor was available at university.

Before writing their first drafts, the instructor asked students which feedback method(s) they preferred. So the students were free to choose their preferred feedback method(s) from among the three options. They could make use of all three options, some of them, or one of them. Based on their choice of feedback the participants were assigned to four experimental groups. Group A (14males, 18 females, face-to-face feedback only), Group B (11 males, 9 females, online direct feedback and online indirect feedback), Group C (14 males, 21 females, online indirect feedback and face-to-face feedback), Group D (13 males, 20 females, online indirect feedback only). Other feedback methods and their combinations such as no feedback, online direct feedback, online direct and online indirect and face to face feedback, and online direct and face to face feedback methods were not chosen by the students.

In order to assess the students' writing performance, two raters who were experienced teachers were chosen. They discussed the rating scale by Weir (Cited in Weigle, 2002) and they agreed that this rating scale was suitable for the purpose of rating the participants' performance on the five drafts of essay writing task. For evaluating the inter-rater reliability, 10 first draft essays were given to them separately. In order to understand whether the ratings allocated by the two raters were consistent or not, a correlation was run between the two raters. Inter-rater reliability coefficient was also computed and it was .91 for the first drafts.

Design

The design of this study was a descriptive ex post facto correlational design. The reason for choosing this design rested upon the fact that this design explored the relationship between EFL students' level of computer anxiety and their choices of feedback method(s), and it also provided information concerning the difference between the writing performances of the students based on the feedback methods they chose. Computer anxiety was the predictor variable and feedback method(s), i.e., online direct feedback, online indirect feedback, and face-to-face feedback were the predicted variables of the research study. Also a true experimental design was employed in this study as well since the participants were randomly selected and during a 5 week course of treatment they received feedback on their writing performance based on their preferred feedback method(s). The chosen feedback method was the independent variable and the writing performance of the participants was the dependent variable. The age of the participants was the control variable since all participants were between the age range of 21-25. The language proficiency of the participants was another control variable of the research study. The gender of the participants was the intervening variable since the researcher had no control over it.

Result and Discussion

The results of the study are summarized in the following tables.

Checking the null hypotheses of the study

The first null hypothesis of the study stated that there is no significant relationship between EFL students' level of computer anxiety and the feedback method(s) they select during the revision stage of a writing assignment. In order to investigate the relationship between computer anxiety and the feedback method(s) the participants chose, a chi square test was conducted since both variables were categorical. As the number of participants in each feedback group was more than 5, the assumption of running a chi square test namely, having at least 5 or more participants in each group was not violated. Table 1 and 2 present the result.

Table 1. Descriptive statistics of the chi-square test.

	Cases					
	Valid		Missing		Total	
	N	Percent	N	Percent	N	Percent
anxiety group * feedback method	120	100.0%	0	.0%	120	100.0%

Table 2. Descriptive statistics of participants' feedback method(s) and level of anxiety.

	Online direct	Face-to-Face	Online indirect, Face-to-face	Online direct, Online indirect	Total
No anxiety	16	5	6	10	37
Low anxiety	11	5	17	5	38
Moderate/high anxiety	6	22	12	5	45
Total	33	32	35	20	120

As the table shows, a translated version of Computer Anxiety Rating Scale (CARS) developed by Heinssen, Glass, and Knight (1987) was used to measure students' level of computer anxiety. The participants were grouped into three levels of computer anxiety: no anxiety (29-57), low anxiety (58-86), and moderate/ high anxiety (87-114). The minimum and maximum scores ranged from 19-114.

Table 3. Chi-square tests.

	Value	df	Asymp. Sig. (2- sided)
Pearson Chi-Square	28.861[a]	6	.000
Likelihood Ratio	28.335	6	.000
Linear-by-Linear Association	1.534	1	.216
N of Valid Cases	120		

As can be seen from the above table, the Pearson chi square value is 28.86, with an associated significance level of .0005. This is smaller than .05, so we can conclude that the results are significant and there is a significant correlation between the level of computer anxiety and the feedback methods the participants have chosen. Therefore, the first null hypothesis could be safely rejected. The results of this study was consistent with previous research showing that highly computer anxious individuals report a greater tendency toward exhibiting behaviors associated with avoiding computers if circumstances permit (Carver, 1991; Deane, 1995; 1990). Specifically, a significant difference in level of computer anxiety was found in groups B, C, and D that distinguished those students who opted for online feedback from students who refrained from it. Interpretation of these results suggests that when given the choice of feedback method for their writing, the students who were higher in computer anxiety usually opted for the method that involved no computer use, whereas their peers who were lower in anxiety usually opted for the method that involved computer use.

The second null hypothesis of the study stated that there is no significant difference between the writing performance of EFL students based on the feedback method(s) they choose. In order to investigate the null hypothesis, a one way Analysis of Variance (ANOVA) was conducted due to the fact that there was one independent (grouping) variable with 4 levels (groups), and one dependent variable. In the case of this research, the independent (grouping) variable was the participants' choice of feedback method(s) and the dependent variable was their performance in the final draft of writing. Of course, before conducting ANOVA as one of its assumptions, the normality of the scores of the final draft of the writing of the participants had to be checked.

As can be seen from Table 4, all feedback groups had a normal distribution and the researcher felt confident to go on with the analysis of variance.

Table 4. Normality of the distribution of final draft writing scores.

Feedback group	Skewness/Std Error
Face-to-face	-.295/.414=.71
Online indirect	-.092/.409=.22
Online indirect/Direct	.469/.512=.91
Online indirect/Face-to-face	-.484/.403=1.20

As presented in the table above, all of the statistics turned out to be between the range of -1.96 and 1.96 proving the normality of the distribution of scores of the last draft of writing. However, the next assumption to be checked before running an ANOVA was the equality of variances. Table 5 details the Levene's test of homogeneity of variances.

Table 5. Test of homogeneity of variances.

Levene statistic	df1	df2	Sig.
2.725	3	116	.047

As can be seen from Table 5, the assumption of homogeneity of variances was violated as the Sig. value (.047) turned out to be smaller than .05. Therefore, the researcher had to apply a non-parametric alternative to a one-way between groups' analysis of variance which is the Kruskal-Wallis Test. Tables 6 and 7 present the results.

Table 6. Kruskal-wallis test results for the scores of final draft writing of feedback groups.

	Feedback group	N	Mean Rank
Last draft writing	Online indirect	33	53.80
	Face to face	32	52.69
	Online indirect/direct	20	69.10
	Online indirect/face to face	35	69.04
	Total	120	

As can be seen in the above table, the highest rank belonged to online direct/indirect feedback group (69.1) followed by the online/face to face feedback group (69.04) and the online indirect feedback group (53.80) and face to face feedback group (52.69) respectively.

Of course the researcher had to see whether these differences are significant or not by referring to the chi square table (Table 1).

Table 7. Chi-square test statistics a, b.

	Last draft writing
Chi-square	6.273
Df	3
Asymp. Sig.	.099

a. Kruskal Wallis Test

b. Grouping Variable: feedback group

As depicted from Table 7, the Asymp. Sig. value (.099) came out to be larger than .05, so it can be concluded that there is no significant difference between the writing performance of EFL students based on the feedback method(s) they choose. Therefore, the second null hypothesis could not be rejected.

Conclusion

The data analysis demonstrated that the students' choices of feedback method(s) varied according to their levels of computer anxiety and that depending on the learners' level of computer anxiety, their choice of feedback method was different. Without multiple feedback options, some students apparently would not have performed as well as they did. Thus, it became clear that although computer-assisted instruction is typically a very student-centered process (Kern, 1995; Sulliva, 1996), it is the pivotal responsibility of the teacher to ensure effective learning by providing classroom feedback methods that are matched to students' individual feedback preferences. Indeed, clarification by further research is necessary to understand better the effects of individual preferences, including factors that can lead to computer anxiety, in foreign language learning.

Pedagogical Implications

On the basis of Eysenck and Calvo's (1992) processing efficiency theory that "the presence of worry about task performance typically leads to the allocation of extra processing resources to the task, in an attempt to improve performance and thus reduce or eliminate worry", it was expected that high-anxiety students would seek more forms of assistance than their low-anxiety peers if multiple forms of assistance were available. So the findings of this study revealed the importance of recognizing computer anxiety and creating a learning environment in which students who were highly computer anxious were not disadvantaged because they had the opportunity to choose their preferred feedback method(s). Also, it provided a new way to understand and assess people's behaviors, attitudes, interpersonal skills, and potentialities in regards with using computers and their anxiety levels in doing so. Understanding which factors may affect learners' behavior and attitude towards the feedback they prefer to get would assist an educational system in the process of developing those attributes.

The conclusions emerging from this study have implication for EFL teachers. Since students' preferred feedback method(s) proved to be useful in actual classroom procedure with Iranian EFL learners, EFL teachers can easily improve effective learning by providing classroom feedback(s) that are matched to students' individual feedback preferences, that is, when the feedback methods used minimizes the students' level of anxiety.

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