EXPLORATION OF THE ATTITUDES OF FRESHMAN FOREIGN LANGUAGE STUDENTS TOWARD USING COMPUTERS AT A TURKISH STATE UNIVERSITY

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ABSTRACT
The present study expands the design of Warschauer (1996) surveying freshman foreign language students at a Turkish university. Motivating aspects of computer assisted instruction in terms of writing and e-mailing are explored through an exploratory factor analysis conducted on the survey developed by Warschauer (1996). Findings suggest that learners have positive attitudes towards CALL because of computers' potential to sustain independence, learning, collaboration, instrumental benefits, empowerment, comfort and communication. Influence of several background variables on attitudes towards CALL is also explored through relevant parametric tests. Analyses revealed that gender and age did not have an effect on attitude scores whereas having a PC at home, PC experience and hours of Internet use were related to attitudes towards CALL. Implications of the present study and suggestions for further research are provided.

Keywords: CALL; Computer Mediated Communication (CMC); Attitudes; Computer assisted writing.

INTRODUCTION

Learning a second language is a process, which requires time, effort and patience. The learner needs to be actively involved in this process. Such active involvement depends largely on learners' attitudes, particularly on motivation. In recent years, there has been multifarious studies re-examining the relationship of second language learning (henceforth, SLA) and motivation, and criticisms and elaboration of the pioneering studies are suggested.

Gardner & Lambert (1972) reported the ways they established scientific research procedures in terms of SLA research, and brought second language (L2) motivation research to maturity to some extent. However, their model which also differentiated between integrative and instrumental motivation has been criticized a lot since it is on general motivational components in social psychological theory rather than educational theory. More specifically, even though it does include an educational dimension allowing learners to evaluate learning situations, its emphasis is more on basic motivational aspects in social settings rather than in SLA settings (Crookes & Schmidt, 1991).

Dörnyei (1994) claims that L2 motivation is an eclectic and multifaceted construct which necessitates introduction of different levels of motivation, namely 'language level' that coincides with the social dimension, 'learner level' that coincides with the personal dimension and 'situation level' that is in line with the subject-matter dimension. Moreover, he considers the literature on motivation to be far from being pragmatic. Therefore, in order to provide educators with a more precise guide to make teaching more motivating, practical motivational strategies should be listed (Dörnyei, 1994).

Motivation has been generally examined under the headlines of being either intrinsic or extrinsic 'depending on whether the stimulus for the behavior originated outside or inside the individual' (Van Lier, 1996: 101). The basic motive behind this differentiation is that some aspects of the motivation are related with past and future sources of internal urge (i.e. extrinsic) and some others are related with present sources of the very same urge (i.e. intrinsic). Language and language learning are complex issues; therefore, it is not easy to claim that language learning should be considered under the basic headline of intrinsic motives. It of course has intrinsic aspects, because when language skills and challenges are balanced, the learner experiences a stage of equilibrium and finds pleasure in doing the activity at that moment. It should not be considered just under the headline of extrinsic motives, either. It has extrinsic aspects, that is, goals in directing action might be comprised of instrumental drives, needs and other responses.

Oxford & Shearin (1994) claim that the traditional model that differentiates between intrinsic and extrinsic motives is too general or ill-defined. They maintain that in order to determine the source of the real motives, goal-setting can have exceptional importance in stimulating L2 learning motivation; therefore, more time and energy should be spend in the L2 classroom on goal setting. They suggest that goals, expectancies and self-efficacy affect performance because they promote persistence and increased effort especially on tasks with time limits. Individual goals direct attention toward goal-relevant action, stimulate individuals to develop meta-cognitive plans and enhance the quality of analytic strategies used. Beside goal setting theories, expectancy

theories also play an important role in determining the features of motivation since organisms anticipate events, and their behaviors are sometimes guided by those anticipatory states. Therefore, the higher the expectancy for a behavior to produce a specific outcome, the greater tends to be the motivation.

According to Van Lier (1996), motivation might have three different sources. It may stem from the past experiences which might be drives, needs, learning or other responses programmed throughout time in the learner. It might be in the present that is the enjoyment of the performance in present, which generally coincides with intrinsic motivation. It might also be in future such as the goals directing learners to act. Future goals might be either intrinsic or extrinsic. In language teaching, it is not easy to find clear-cut distinctions between those three aspects. Individual variables such as learner orientation and need achievement, situational variables such as the nature of the learning materials, teaching techniques and teacher attitudes might all affect the way motivation finds itself (Gardner & Tremblay, 1994). Therefore, in computer assisted language learning settings (henceforth, CALL), it is important to find out about the motivating aspects and positive attitudes towards computers, since these aspects of CALL constitute a fertile field that needs further scrutiny.

CALL and motivation

Computers have been used for language teaching since 1960s. This period is divided into three periods by Warschauer & Healey (1998). The first one is Behaviorist CALL featuring repetitive drills which is also named drill and practice method. The second one is Communicative CALL, which is the correspondence of cognitive theories that recognized learning as a creative process, and rejected Behaviorist CALL. This period focused more on using forms rather than the forms themselves. The third one is Integrative CALL, which moved the theory from a cognitive view to a socio-cognitive view, and gave importance to authentic use of language in meaningful contexts. It also emphasized the integration of each skill via multimedia networked computers providing foreign language learners with opportunities to use information, communication and publication tools.

Lee (2000) identifies eight categories to which net-work-based technology may contribute, namely experiential learning, motivation, amelioration of student achievement, supply of authentic materials for study, greater opportunities for interaction, support for individualized learning, independence from a single source of information and global understanding. Chapelle and Jamieson (2002) provide a more precise outline of the contributions of computer-assisted instruction under three basic themes that are elaborated further, namely offering elaborated and rich input, providing negative feedback and promoting collaborative learning. Interestingly, Chapelle and Jamieson (1991), reviewing results of research into the effectiveness of CALL, had said that they had not found superiority of CALL over classroom instruction.

Several sets of conditions that should be created for successful language learning with regard to computer applications are clearly identified in Chapelle (2001). One of these issues is examined under the title of affective aspects of learning on which there is a vast literature. The view Lee (2000) elaborates on about motivation is unfortunately intuitive, that is, he claims that computers are popular among students just because of their being fashionable or their being associated with fun or games. However, the prelude of communication via computers is believed to enhance students' motivation level by providing a less threatening means to learn with, providing stimulating contact, and facilitating work on meaningful activities, since computer assisted communication changed the routine from student-machine interaction to student-student interaction (Warschauer, 1996).

In this respect, it is relevant to take Warschauer's (1996) criticisms into account. He claims that much of the research is devoted to computer-assisted instruction in general. However, foreign language instruction is a complex issue which should be scrutinized more. Secondly, he claims that research regarding motivational aspects of computer-assisted instruction is outdated. He is right to the extent that in recent years there have been great developments in technology. Multimedia-tools, network applications and World Wide Web have become more popular generating new dimensions that could be motivating. For instance, with the rise of e-mailing and World Wide Web, beside the novelty of the material and learner control as motivational aspects (Kinzie, Sullivan & Berdel, 1988), the construct of 'willingness to communicate (WTC)' appears on stage. MacIntyre, Clement, Dörnyei and Noels (1998) define this issue as a 'situation-based variable representing an intention to communicate at a specific time to a specific person' (p. 559). What Van Lier (1996) meant when he introduced authentic engagement in an activity was probably one of the antecedents of WTC. Moreover, if WTC is conceptualized as something 'situation-based', this brings the idea that classroom learning activities and classroom applications of computers interact with and influence the development of the desire to communicate. The notion of the desire to communicate also suggests that WTC is individual-based as well.

The current study basically deals with attitudes towards using computers and network applications in communication and in writing. Pennington (1996) reviews a substantial number of previous studies on first

language (L1) and foreign language (L2) computer writing and concludes that computers are beneficial in writing processes, revision behavior, affective/social outcomes, quality of the written work and quantity of writing. Warschauer (1996) surveyed learners' feelings and attitudes toward computer writing and e-mail communication. Results indicated that students had positive attitudes toward computer writing and computer mediated communication. They could write better, be more creative and save time using word processing compared to writing by hand. Chikamatsu (2003) examines the effects of computers on writing efficiency and quality among intermediate learners of Japanese and concludes that writing is a process which requires multiple planning, developing and revising phases that are accomplished in a joyful and effective way via computers even with a logographic language (i.e. Japanese).

Our second concern is the motivational aspects of using computers in communication. This concern stems from the WTC construct, which is generated from Vygotsky's (1978) ideas of learning from a social dialogue. Computer mediated communication (henceforth, CMC) is also considered to be a tool just like a word processing program to realize communicative purposes rather than an omnipotent instructional source. It involves direct human-to-human interaction rather than human-to-machine interaction which is considered to be one of revolutionary developments in computer-based fields (Warschauer, 1996).

Sullivan (1993) claims that computer-mediated language classrooms encourage collaborative learning, social interaction, and invention that will eventually result in increased self-esteem. According to Sayers (1993), through sharing culture packages and collaborative projects between different classes via CMC tools, students are provided with opportunities to display and share their linguistic competencies and varied cultural experiences which foster genuine language learning and authentic knowledge. After collecting data via a longitudinal study of first-year German students, Chun (1993) concludes that CMC allows students to play a greater role in managing the discourse. They feel freer to suggest a new topic, follow-up their friends' ideas and request more information. The important point here is that they are more motivated to take the initiative than they are in the normal classroom since the instructor's role in CMC setting is decentralized. Warschauer (1996) identifies four basic motivating aspects in computer assisted language instruction namely, the novelty of working with a new medium, individualized nature of computer-assisted instruction, opportunities for learner control and opportunities for non-judgmental and rapid feedback.

CMC offers the promise of increased interaction not only locally but also globally using the resources such as World Wide Web in addition to providing learners with opportunities to negotiate outside the classroom (Kern, 1996). Kern (1996) further claims that learners shift from a consultative mode to a real communicative mode through CMC. Consultative mode involves using a finite and authoritative informational base in order to realize language related tasks. In contrast, communicative mode involves learners in interaction, asking questions, providing explanations, comparing interpretations and working collaboratively with both their teachers and peers. This sustains control over learning in which learners can achieve greater learning in the same amount of time than can student not given such a control (Kinzie et al. 1988).

It is relevant here to state Sullivan's (1993) ideas both in terms of computer writing and CMC. She identifies five ideal characteristics that could be realized better in a computer-assisted language classroom. First of all, meaningful interaction allowing individual accountability is realized better in a computer writing classroom via support of PC networks. This is mostly because a network environment is freer of risk than any traditional teacher-centered classroom. Secondly, positive interdependence is realized via networks in which students are free and encouraged to collaborate in generating discussion groups, which also allows them to critique each other's papers. Thirdly, dissention is encouraged in CMC environments, that is, students feel free and confident to voice opposing viewpoints at the computer since computers are 'nonconfrontational'. Fourthly, students have opportunities to negotiate meaning and improve their problem-solving skills. Finally, what is created in CMC settings could be better stored which allows reviewing and elaborating on ideas for further activities.

Warschauer (1996), integrating the issue of computer writing and CMC, and surveying 167 university students in different ESL and EFL academic writing settings, concludes that language students have positive attitudes toward using computers for writing and communication in language classrooms. Factors influencing students' attitudes toward computers are considered to be instrumental benefits of computer-mediated communication, the feeling of personal empowerment and a sense of achievement.

The present study adapts the survey of Warschauer (1996) for our unique context, freshman foreign language students. The motivating aspects of using computers for these students in terms of computer writing tasks and computer assisted communication are explored. The study specifically focuses on the following research questions:

1. What aspects of using a PC for writing and communication create positive attitudes in freshman foreign language students?
2. Do attitudes towards CALL vary when different backgrounds are taken into consideration?

METHODS AND PROCEDURES

Participants

A hundred and fifty five freshman students at a Turkish state university in Eskisehir, Turkey participated in the study. All of them are native speakers of Turkish and speak English at an advanced level. Profile of the participants is provided in Table 1:

Table 1. Profile of the participants

		Frequency	Percent (%)
Gender	Male	41	26,5
	Female	114	73,5
PC at home	Yes	75	48,4
	No	80	51,6
Age	17-19	106	68,4
	20-22	42	27,1
	23 and over	7	4,5
	Total	**155**	**100**

Data Collection

Students were administered an anonymous survey in English. The survey used by Warschauer (1996) was taken as the core of our survey; however, some items were revised in accordance with the study context after it was administered to five students to find out about the ambiguous items. The first part of the survey included a personal information form which was used to collect the independent variables of the study, namely, gender, age, family income, and number of years' experience with a PC. Students were also asked to specify whether they had a computer at home / dormitory or not. They were asked to rate the frequency of using PCs for several purposes through a Likert-type questionnaire. The format of this part created a high internal reliability for the sample group (α=.835). Finally, students were asked to state the hours of using Internet per week.

In the second part of questionnaire, 30 five-point Likert Scale questions (5 being the highest score) were asked that were related to students' feelings about using computers. Eight of the questions were reverse-coded in order to increase the reliability of the instrument. Throughout the paper, the reversed version of the sentences will be used so that a consistency could be built for readers. The first five questions primarily focused on using computers for word processing. The next 11 questions focused on using computers for interpersonal communication and e-mailing. Final 14 questions elaborated on students' general feelings about using computers in their composition classroom.

The students were administered the survey during their normal class period at the 10th week of the 2006 fall semester. They were given clear instructions about the questions and the scales.

Data Analysis

First, constructs underlying the questionnaire of Warschauer (1996) in the Turkish context have been examined through factor analysis. Factor analysis is used to summarize the questions within plausible components. The analysis is used as a data reduction technique, which takes a large set of variables and looks for a way to reduce or summarizes the data using a smaller set of components (Pallant, 2001). As the factor analysis, Maximum Likelihood was applied as the extraction method. In the current data, it was possible to apply principal component analysis as well, which is more popular (Pallant, 2001). The principal component analysis could explain 64 % of the variance which was great based on the suggestions of Dunteman (1989). Nevertheless, a conservative path was followed which led to more robust results. The assumption of multivariate normal distribution was given utmost importance which is controlled by the Maximum Likelihood estimation. This estimation was also considered more robust to the effect of small sample sizes (Tanaka, 1987). Moreover, it was shown that ML estimates are least affected in comparison to alternative methods used for non-normal samples (Tanaka, 1984). Finally, ML tends to provide a strong and more appropriate test to determine how many factors underlie the data (Kroonenberg & Lewis, 1982). Thus, items of the scale were examined through the ML extraction method.

After the factors were determined, each factor was investigated through further parametric tests to see the influence of each predictor variable on total scores in the questionnaire. T-tests were used to compare students in terms of having a PC at home, and in terms of gender; one-way ANOVAs were used to compare age groups; and Pearson Product Moment correlation coefficient was used in order to find out the relationship between factor scores and the predictor variables. Significant correlation coefficients were determined according to statistical tables of Fisher (1963). For all analyses, the data were checked in accordance with the normality and equal variances assumptions. For normality, skewness and kurtosis coefficients were checked as suggested by Huck (2000). For the equal variances assumption, Levene's Test value was examined.

RESULTS

Before conducting the factor analysis and examining students' CALL attitude scores, participants' PC use habits were reported first. This might provide readers with a clearer idea about the background of the sample participated in the current study. In order to determine which features of PCs were used most by the sample, 14 one-sample t-tests were conducted for 14 features with a Bonferroni Adjustment which reduced the critical alpha from .05 to .0036. More specifically, the frequency of use for each PC use habit was compared to the neutral value of 3. Analyses revealed that students often used PCs for e-mailing (χ=4.44; t=18.07; p<.001), researching via the web (χ=4.72; t=26.310; p<.001), chatting (χ=3.72; t=6.666; p<.001), watching movies (χ=3.59; t=5.560; p<.001), and online registration (χ=3.37; t=3.217; p<.001). They rarely used PCs for database (χ=2.18; t=-7.516; p<.001), excel (χ=2.31; t=-7.342; p<.001), graphics design (χ=2.40; t=-5.835; p<.001) and games (χ=2.55; t=-3.727; p<.001). Below, research questions are addressed in line with corresponding parametric tests.

a. What aspects of using a PC for writing and communication create positive attitudes in freshman foreign language students?

The mean score for all students were 3.53 which were greater than the neutral mean at a statistically significant level (T_{153}=13.687, p< .001). The question that generated the highest positive response was the 24th question, "learning how to use computers is important for my career" (χ=4.45, T_{153}=4.065, p<.001). Each question's mean and standard deviation will be reported after the inappropriate scale items have been eliminated through the factor analysis.

Items of the scale were examined through maximum likelihood analysis using SPSS 15.0 for windows. First of all, the suitability of data for factor analysis was assessed. The first concern was the sample size. Kass and Tinsley (1979) suggest having between 5 and 10 subjects per items of the scale up to a total of 300. If the number reaches up to 300, test parameters tend to be stable regardless of the subject to variable ratio. Field (2000) and Tabachnick and Fidell (1966) agree that it is plausible to have at least 300 cases for factor analysis. Finally, Comrey and Lee (1992) believe that 100 is poor sample size, 300 can be considered as good, and 1000 and more is excellent. Based on this information, it can be said that the current data is slightly above the suggested limits in terms of sample size. The current sample (N=155) included five times more participants than the number of items as suggested by Kass and Tinsley (1979). However, further inspections were conducted as suggested by Pallant (2001). Thus, the next step was to check the Kaiser-Meyer-Oklin Measure of Sampling Adequacy.

Kaiser-Meyer-Oklin Measure of Sampling Adequacy is calculated for individual and multiple variables and represents the ratio of the squared correlation between variables to the squared partial correlation between variables (Field, 2000). The KMO value varies between 0 and 1. A value of 0 indicates that the sum of partial correlations is large relative to the sum of correlations, whilst a value close to 1 indicates that patterns of correlations are compact, and so factor analysis will yield reliable factors. Kaiser (1974) suggests that values greater than 0.5 should be accepted. Pallant (2001) claims that the KMO statistic should be larger than 0.6. Hutcheson and Sofroniou (1999) suggest that values between 0.5 and 0.7 are normal, values between 0.7 and 0.8 are good, values between 0.8 and 0.9 are great, and values above 0.9 are superb. The initial solution of our factor analysis revealed a KMO value of 0.766, which is far better than the acceptable value.

Next concern is that Bartlett's Test of Sphericity should reach a significance value to support the factorability of the correlation matrix obtained from the items (Pallant, 2001). Bartlett's Test of Sphericity revealed an ideal Approx. Chi-Square value (χ^2=1432.732) with a significance value of .0005, which meant that the factorability of our correlation matrix was proper. The maximum likelihood analysis revealed the presence of 8 components with eigenvalues exceeding 1, which explained 46.429 % of the total variance. Field (2000) suggests that loadings less than 0.4 be suppressed in the output. Besides, Pallant (2001) claims that if items load above 0.3, this is a strong loading which should not be deleted. Most items had loadings above 0.3, and variables with lesser values were deleted from the analysis. Next, items with very close loadings (i.e. less than .01) under different

components were suppressed from the analysis to prevent multicollinearity. Only two items (i.e. question 5 and 10) had small corrected item-total correlation values (i.e. .218 and .216, respectively) which were also suppressed as suggested by Pallant (2001). The factor analysis was repeated revealing 7 factors with eigenvalues exceeding 1.0. The total number of questions was determined as 23 which meant that seven questions were eliminated from the scale. The analysis with the new set of items revealed a better KMO value along with an ideal Bartlett value again as can be seen in Table 2:

Table 2. KMO and Bartlett's Test

Kaiser-Meyer-Oklin measure of sampling adequacy	,786
Bartlett's Test of Sphericity	
Approximate χ^2	1360,301
Df	378
Sig.	,001

The Cronbach's Alpha was .867 after the problematic items were suppressed. The analysis explained 45.731 % of the total variance. It is claimed that the higher the variability explained by the factor analysis, the stronger the factor structure of the scale is. However, values ranging from 40 % to 60 % are considered acceptable for social studies (Dunteman, 1989). Thus, the variance explained is considered appropriate for the current study. Variance explained by each component is illustrated in Table 3:

Table 3. Total variance explained

Component	Initial Eigenvalues			Sums of Squared Loadings after Extraction and Rotation		
	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %
1,000	7,085	25,303	25,303	2,733	9,760	9,760
2,000	2,104	7,514	32,818	2,383	8,512	18,272
3,000	1,853	6,618	39,436	2,097	7,490	25,763
4,000	1,619	5,783	45,219	1,747	6,240	32,002
5,000	1,438	5,134	50,353	1,409	5,034	37,036
6,000	1,257	4,490	54,842	1,400	5,001	42,036
7,000	1,168	4,173	59,015	1,035	3,695	45,731
8,000	1,003	3,583	62,598			
9,000	0,969	3,460	66,058			
10,000	0,916	3,273	69,331			
11,000	0,824	2,944	72,275			
12,000	0,815	2,909	75,184			
13,000	0,724	2,584	77,768			
14,000	0,706	2,521	80,288			
15,000	0,655	2,339	82,627			
Subsequent rows are omitted to save space.						

As mentioned above, the number of factors was determined as seven. To interpret factors, they are rotated through Varimax Rotation. It is an orthogonal approach which assumes that the factors are not related. Moreover, Varimax Rotation tends to be easier and clearer to interpret (Pallant, 2001). Seven factors after rotation showed a slightly different pattern from that of Warschauer (1996). Factors included in each label, item means and standard deviations, and Varimax rotation loadings are provided in Table 4:

Table 4. Means, standard deviations, and Varimax rotation loadings:

Items and Factors		Mean	SD	Varimax factor load
Factor 1:Independence (α=,805)				
27	I can learn English faster when I use a computer.	3,191	0,995	,717
25	I can learn English more independently when I use a computer.	3,658	1,041	,648
28	Using a computer gives me more chances to practice English.	3,771	0,914	,624
22	Using a computer gives me more control over my learning.	3,392	0,890	,500
19	Using a computer gives me more chances to read and use authentic English.	3,561	0,968	,477
20	I want to continue using a computer in my other classes.	3,871	0,978	,429
Factor II: Learning (α=,69)				
15	Using e-mail and the Internet is a good way to learn more about different people and cultures.	4,221	0,850	,622
17	Learning to use a computer gives me a feeling of accomplishment.	3,845	0,846	,489
16	Communicating by e-mail is a good way to improve my English.	3,812	0,975	,462
9	I enjoy using the computer to communicate with my teachers.	3,314	1,079	,447
4	I enjoy seeing the things I write printed out.	3,877	0,893	,418
Factor III: Collaboration (α=,728)				
13	Writing to other by e-mail helps me develop my thoughts and ideas.	3,316	1,051	,798
14	Using e-mail and the Internet makes me feel part of a community.	3,455	1,132	,625
11	E-mail helps people learn from each other.	3,753	1,044	,605
Factor IV: Instrumental benefits(α=,701)				
1	I can write better essays when I do them on computer.	2,682	1,113	,717
3	I enjoy writing my papers by computer than by hand.	2,757	1,297	,661
2	Revising my papers is a lot easier when I write them on computer.	3,253	1,169	,536
Factor V: Empowerment (α=,704)				
26	Computers keep people close to each other.	2,701	1,264	,757
30	Computers make people strong and powerful.	3,471	1,229	,655
Factor VI: Comfort (α=,703)				
8	I am more afraid to contact people in person than by e-mail.	3,808	1,011	,532
21	Using a computer is worth the time and effort.	3,844	1,073	,426
Factor VII: Communication (α=,772)				
6	I enjoy using the computer to communicate with people around the world.	4,301	0,932	,535
7	I enjoy using the computer to communicate with my classmates.	3,922	1,169	,697

The author suggests that the total score be used as the attitude score towards computer assisted writing. The maximum possible score from the current 23-item scale is 115 while the minimum score is 23. The maximum score of the current sample was 104 while the minimum score was 44. The total score calculated for the current sample revealed a normal distribution with ideal skewness and kurtosis values as suggested by Huck (2000). The current sample's descriptive statistics are provided in Table 5.

Table 5. Descriptive statistics of the total scores

		Statistic	Std. Error
Mean		81,993	0,926
95% Confidence Interval for Mean	Lower Bound	80,164	
	Upper Bound	83,822	
5% Trimmed Mean		82,621	
Median		82,000	
Variance		132,864	
Std. Deviation		11,527	
Minimum		44,000	
Maximum		104,000	
Range		60,000	
Interquartile Range		15,000	
Skewness		-0,880	0,195
Kurtosis		1,229	0,387

b. Do attitudes towards CALL vary when different backgrounds are taken into consideration?

Overall scores of the students were examined with regard to several independent / predictor variables. Two independent-samples t-tests were conducted for the influence of gender and for that of having a PC at home. Then a one-way ANOVA was conducted to see the influence of age. Since three parametric tests were conducted, Bonferroni Adjustment was applied to reduce the likelihood of committing a Type I error as suggested by Huck (2000). Thus, the alpha was determined as .016 for the parametric tests.

Gender

In order to determine whether attitude scores differed between male and female students, an independent-samples t-test was conducted. The independent-samples T-test is provided in Table 6:

Table 6. Independent samples t-test comparing males and females in terms of total scores

	N	Mean	SD	T	df	Sig.
Male	41	82,634	13,252	,414	153	,679
Female	114	81,762	10,895			

The independent-samples t-test comparing scores of male and female students showed that males and females did not differ from each other in terms of attitudes toward computer assisted writing and communication.

Having a PC at Home

In order to see whether total scores differed between students who had a PC at home from those who did not, another independent-samples t-test was conducted. After the normal distribution and equal variances assumptions were checked, the independent-samples t-test was conducted. The summary table is provided below:

Table 7. Independent samples t-test comparing total scores of students who have a PC at home and those who do not

	N	Mean	SD	T	df	Sig.
Yes	75	84,359	11,657	2,518	153	,013
No	80	79,774	11,019			

As the table suggests, the test revealed that students who had a PC at home had significantly more positive attitudes towards computers than students who did not have a PC at home.

Age:

In order to see whether the students' attitudes towards CALL varied in accordance with age, a one-way between-groups ANOVA was conducted. Table 8 provides the descriptive statistics regarding age groups:

Table 8. Desciptive statistics regarding age

	N	Mean	Std. Deviation
17-19	106	82,509	11,627
20-22	42	80,523	11,562
23 and over	7	82,999	10,488

As the table suggests, the means did not seem to differ a lot from each other. The summary of the one-way ANOVA is given in Table 9:

Table 9. Summary of one-way ANOVA on age groups

Source	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	125,987	2,000	62,993	0,471	0,625
Within Groups	20335,006	152,000	133,783		
Total	20460,993	154,000			

As the result of the ANOVA revealed, the groups did not differ on their attitudes towards CALL in terms of age.

Other Predictors of Total Scores

Other variables addressed in the questionnaire had a continuous nature which required calculating correlation coefficients between those variables and the total scores in the questionnaire. In this section, four variables were checked and interpreted to examine whether they had a predicting role in overall scores. Thus, a Bonferroni Adjustment procedure was applied and the significant p-value was determined as .0125 in the following table:

Table 10. Pearson correlation coefficients among potential predictor variables

Correlations	Total scores on the questionnaire	Experience	Monthly Income	Internet use (Hour / week)
Total scores on the questionnaire	-	0,177*	0,083	0,408**
Experience with a PC		-	0,289**	0,140
Monthly income			-	0,137
* Correlation is significant at the 0.05 level (2-tailed).				
** Correlation is significant at the 0.01 level (2-tailed).				

As the table suggests attitude scores of the sample were positively related with experience with a PC and hours of Internet use per week. Moreover, a relationship between the experience with a PC and monthly income was found which was expected.

DISCUSSION

The current study tried to adapt the questionnaire developed by Warschauer (1996). The questionnaire tries to address different levels of motivation including the language level, learner level and the situation level as suggested by Dörnyei (1994). In order to identify practical motivational strategies as suggested by Dörnyei (1994), motivational aspects regarding language learners were investigated first, which could be a contribution attributed to the present study. Besides, the questionnaire involves both extrinsic and intrinsic characteristics of motivation. However, more comprehensive works focusing on student characteristics in terms of goal setting and expectancy theories are needed to nourish the theoretical framework in line with the suggestions of Oxford and Shearin (1994).

Exploratory factor analysis revealed seven factors with high internal reliability coefficients and eigenvalues which were named as independence, learning, collaboration, instrumental benefits, empowerment, comfort and communication. Factors were somewhat similar to those of Warschauer (1996) with slight changes and additions within and among factors. Warschauer (1996) had named his factors as independence and creativity, communication, learning, achievement, and instrumental benefits of writing. The differences between two exploratory factor analyses suggested that the factor structure of a reliable and valid CALL attitude scale could vary according to the language context. However, in order to create robust theories in terms of the difference of factors among contexts, structural equation modeling analyses are needed where students from several contexts

are administered the same questionnaire, and confirmatory factor analyses are conducted followed by model fit controls assuming equal factor structure among different contexts.

Factor structure of the current scale supported the hypotheses of Lee (2000) and Chapelle and Jamieson (2002), that is, CALL involved an atmosphere promoting communication and collaborative learning. The notion of *willingness to communicate* was on stage as suggested in previous studies (Kern, 1996; Kinzie et al., 1988; MacIntyre et al., 1998; Warschauer, 1996). Affective social outcomes and enriched quality of the written work were addressed in the factor structure which supported the hypotheses of Pennington (1996). Students had increased self-esteem since they did not have to face their addressees in person, which was previously suggested by Chun (1993) and Sullivan (1993). Finally, factors and means scores on relevant items implied that students were more creative, wrote better essays, and saved time using computers in comparison to writing by hand (Warschauer, 1996).

As suggested by Van Lier (1996), one of the sources of motivation is past experiences. The current study revealed that past PC experiences have a predictive value on total attitude scores. Enjoyment of the performance generally coincided with intrinsic motivation (Van Lier, 1996), which was emphasized through the scale developed in the current study. However, future aims should be scrutinized with more comprehensive works. For example, the item with the highest mean was the 24th question "Learning how to use computers is important for my career", which addressed future goals; however, the item was eliminated through the exploratory factor analysis. Better items addressing goals and expectancies might be developed to create instruments which can elaborate on past experiences, present enjoyment and future expectancies simultaneously. Moreover, variables addressing learning materials, teaching techniques and teacher attitudes might be added to research designs to scrutinize situational variables better, which might retain the hypotheses of Gardner and Tremblay (1994) on the effects of situational variables on motivation.

Approximately 83 % of the items in the current scale generated positive responses toward using computers in instruction. One could claim that questions constantly generating higher scores than the neutral level should be considered with caution for respondents might have answered all questions with the same pattern. However, students' responses stayed consistent even with the reverse coded items. Moreover, even though Type I error risk was strictly decreased, there were still many items generating significantly positive responses. The results support the assumptions of Lee (2000), that is, computer assisted language instruction might lead to more positive attitudes.

Having a PC at home seemed to have an effect on positive attitudes towards CALL. Warschauer (1996) did not find an influence of the ease of access which was refuted in the current work. However, this result should be examined with caution. Buying a PC can be caused by high positive attitudes towards computers rather than vice versa. Qualitative in depth analyses should be conducted to understand whether students had bought their PCs because they had positive attitudes, or whether they had positive attitudes because they had a PC at home. Finally, gender was not an effective factor on attitudes towards CALL which supported the findings of Warschauer (1996).

Foreign language teachers may enhance students' positive attitudes and motivation by helping them get more knowledge and necessary skills about using computers. As Warschauer (1996) points out, giving students more opportunity to use CMC tools and integrating computer activities into EFL settings can help teachers enhance students' motivation. Allowing students to participate more in efficient negotiation of meaning with anyone they want, on any subject matter they wonder and at any time they wish to participate is a motto, which cannot always be realized in even communicative classrooms. Therefore, computer mediated settings might have the potential to sustain those features and create an ideal atmosphere in language classrooms relatively easily. In this respect, it is crucial for teachers to get theoretical and methodological knowledge and experience on CMC tools in order to help students have more opportunities to communicate via computers and be more motivated toward language learning.

REFERENCES

Catell, R. B. (1966). The scree test for number of factors. *Multivariate Behavioral Research, 1*, 245-276.

Chapelle, C. (2001). *Computer applications in second language acquisition: foundations for teaching, testing and research.* Cambridge: Cambridge University Press.

Chapelle, C., & Jamieson, J. (2002). Computer assisted language learning and distance learning. *LCTL Conference*, Arlington, Virginia.

Chapelle, C., & Jamieson, J. (1991). Internal and external validity issues in research on CALL effectiveness. In P. Dunkel (Ed.), *Computer-assisted language learning and testing - Research issues and practice*, pp. 37-59. NY: Harper & Row - Newbury House.

Chapelle, C., & Jamieson, J. (1986). Computer-assisted language learning as a predictor of success in acquiring English as a second language. *TESOL Quarterly, 20*, 27-46.

Chikamatsu, N. (2003). The effects of computer use on L2 Japanese writing. *Foreign Language Annals, 36* (1), 114-124.

Chun, D. M. (1993). Using computer networking to facilitate the acquisition of interactive competence. *System, 22*(1), 17-31.

Comrey, A. L. & Lee, H. B. (1992). *A first course in factor analysis (2nd edition)*. Hillsdale, NJ: Erlbaum.

Crookes, G., & Schmidt, R. (1991). Motivation: reopening the research agenda. *Language Learning, 4*, 469-512.

Dörnyei, Z. (1994). Motivation and motivating in the foreign language classroom. *The Modern Language Journal, 78* (3), 273-284.

Dunteman, G. H. (1989). *Principal component analysis. Quantitative applications in the social sciences series* (vol. 69). Thousand Oaks, CA: Sage Publications.

Field, A. (2000). *Discovering statistics using SPSS for windows*. London: Sage Publications.

Gardner, R., & Lambert, E. W. (1972). *Attitudes and motivation in second-language learning.* Rowley, Mass: Newbury House Publishers.

Gardner, R., & Trembley, P. F. (1994). On motivation, research agendas, and theoretical frameworks. *The Modern Language Journal, 78*(3), 359-368.

Hatch, E. M. & Lazaraton, A. (1991). *The research manual: design and statistics for applied linguistics.* New York: Newbury House Publishers.

Huck, S. W. (2000). *Reading statistics and research.* New York: Addison Wesley Longman.

Hutcheson, G. & Sofroniou, N. (1999). *The multivariate social scientist*. London: Sage.

Fisher, R. A. (1963). *Statistical tables for biological, agricultural and medical research.* London: Oliver and Boyd.

Kaiser, H. F. (1974). An index of factorial simplicity. *Psychometrika, 39*, 31-36.

Kass, R.A., & Tinsley, H. E. A. (1979). Factor analysis. *Journal of Leisure Research, 11*, 120-138.

Kern, R. (1996). Computer-mediated communication: using e-mail exchanges to explore personal histories in two cultures. In M. Warschauer (Ed.), *Telecollaboration in foreign language learning: proceedings of the Hawai'i Symposium*. Honolulu: Second Language Teaching & Curriculum Center, University of Hawai'i at Manoa.

Kroonenberg, P. M., & Lewis, C. (1982). Methodological issues in the search for a factor model: Exploration through confirmation. *Journal of Educational Statistics, 7* (2), 69-89.

Lee, K. W. (2000). English teachers' barriers to the use of computer-assisted language learning. *The Internet TESL Journal.* Retrieved March 11, 2003 from http://iteslj.org/Articles/Lee-CALLbarriers.html.

MacIntyre, P.D., Clement, R., Dörnyei, Z., & Noels, K.A. (1998). Conceptualizing willingness to communicate in a L2: a situational model of L2 confidence and affiliation. *The Modern Language Journal, 82*(4), 545-562.

Oxford, R. L. (1994). Where are we regarding language learning motivation? *The Modern Language Journal, 78*, 512-527.

Oxford, R. L., & Shearin, J. (1994). Language learning motivation: expanding the theoretical framework. *The Modern Language Journal*, *78*, 12-28.

Pallant, J. (2001). *SPSS survival manual.* Maidenhead, PA: Open University Press.

Pennington, M. C. (1996). T*he computer and the non-native writer: a natural partnership.* Cresskill, NJ: Hampton Press.

Sayers, D. (1993). Distance team teaching and computer learning networks. *TESOL Journal*, *3*(1), 19-23.

Sullivan, N. (1993). Teaching writing on a computer network. *TESOL Journal, 3*(1), 34-35.

Tabachnick, B. G: & Fidell, L. S. (1996). *Using multivariate statistics (3rd edition)*. New York: Harper & Row.

Tanaka, J. S. (1984). Some results on the estimation of covariance structure models. *Dissertation Abstracts International, 45*, 924B.

Tanaka, J. S. (1987). "How big is big enough?": Sample size and goodness of fit in structural equation models with latent variables. *Child Development, 58* (1), 134-146.

Van Lier, L. (1996). *Interaction in the language curriculum: awareness, autonomy, and authenticity.* London: Longman.

Vygotsky, L. S. (1978). *Mind in society: the development of higher psychological processes.* Cambridge: Harward University Press.

Warschauer, M., & Healey, D. (1998). Computers and language learning: an overview. *Language Teaching 31*(2), 57–71.

(Available on-line at: http://www.gse.uci.edu/markw/overview.html)

Warschauer, M. (1996). Motivational aspects of using computers for writing and communication. In M. Warschauer (Ed.), *Telecollaboration in foreign language learning: proceedings of the Hawai'i Symposium*. Honolulu: Second Language Teaching & Curriculum Center, University of Hawai'i at Manoa.

STUDENT SURVEY
PART I

Dear Friend,

With innovations regarding information and communication technologies, it is timely to review students' attitudes towards various aspects of computer assisted learning. The following two-part survey has been designed to diagnose your overall attitudes regarding language learning activities through computers rather than for the purposes of personal evaluation. There is therefore no need to identify yourself by name, and your anonymity in responding to these questions will be safeguarded. We shall be most grateful for time and care you give to answering all of these questions, which will enable us to accurately evaluate the results. Thank you for assisting us in this research study.

Yavuz Akbulut

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Sex: □ Male □ Female

Year of Birth: 19 _ _

No. of years' experience with a computer

□ 2 years or less □ 3-4 years □ 5-6 years □ 7-8 years □ 9-10 years □ more than 11 years

Family's monthly income

□ 0-570 TL □ 571-1210 TL □ 1211-1854 TL □ 1855-2500 TL □ 2500 TL or more

Do you have a personal computer of your own at home / dormitory?

□ Yes □ No

How many hours per week do you use Internet?

□ Less than 2 hours □ 3 - 4 hours □ 5 - 6 hours □ 7 - 8 hours □ 9 - 10 hours □ More than 11 hours

What do you use your PC for and how often? (Please mark as many options as appropriate)

	Always	**Sometimes**	**Neutral**	**Rarely**	**Never**
Word processing	□	□	□	□	□
Database (ASP, PhP)	□	□	□	□	□
Spreadsheet (Excel)	□	□	□	□	□
Designing Graphics / Animations	□	□	□	□	□
Presentation (PowerPoint)	□	□	□	□	□
E-mail	□	□	□	□	□
Web videoconferencing	□	□	□	□	□
Web telephony / audio conferencing	□	□	□	□	□
Researching via the web (Google, etc.)	□	□	□	□	□
Online registration / student affairs	□	□	□	□	□
Designing web-based learning material	□	□	□	□	□
Internet chat	□	□	□	□	□
Games	□	□	□	□	□
Watching VCDs, DVDs	□	□	□	□	□

PART II

(Items which have been deleted from Warschauer's (1996) scale after the factor analysis are given in bold)

For each of the remaining statements, please choose the best one that describes you

1= Strongly disagree 2= Disagree 3= Neutral 4= Agree 5= Strongly Agree

	Statement	Strongly disagree	Disagree	Neutral	Agree	Strongly Agree
1	I can write better essays when I do them on computer. (χ=2.68; t_{153}=-3.549; p<.001)	( )	( )	( )	( )	( )
2	Revising my papers is a lot easier when I write them on computer. (χ=3.25; t_{153}=2.688; p=.008)	( )	( )	( )	( )	( )
3	(reverse coded) I enjoy writing my papers by hand more than by computer. (χ=2.76; t_{151}=-2.314; p=.022)	( )	( )	( )	( )	( )
4	I enjoy seeing the things I write printed out. (χ=3.88; t_{154}=12.239; p<.001)	( )	( )	( )	( )	( )
5	**(reverse coded) Writing papers by hand saves time compared to by computer. (χ=3.06; t_{152}=.567; p=.572)**	( )	( )	( )	( )	( )
6	I enjoy using the computer to communicate with people around the world. (χ=4.30; t_{152}=17.253; p<.001)	( )	( )	( )	( )	( )
7	I enjoy using the computer to communicate with my classmates. (χ=3.92; t_{153}=9.789; p<.001)	( )	( )	( )	( )	( )
8	(reverse coded) I am more afraid to contact people by e-mail than in person. (χ=3.81; t_{150}=9.817; p<.001)	( )	( )	( )	( )	( )
9	I enjoy using the computer to communicate with my teachers. (χ=3.31; t_{152}=3.597; p<.001)	( )	( )	( )	( )	( )
10	**(reverse coded) If I have a question or comment, I would rather contact my teacher in person than by e-mail. (χ=2.37; t_{152}=-7.137; p<.001)**	( )	( )	( )	( )	( )
11	E-mail helps people learn from each other. (χ=3.75; t_{153}=8.957; p<.001)	( )	( )	( )	( )	( )
12	**An advantage of e-mail is you can contact people any time you want. (χ=4.10; t_{153}=14.687; p<.001)**	( )	( )	( )	( )	( )
13	Writing to other by e-mail helps me develop my thoughts and ideas. (χ=3.32; t_{151}=3.704; p<.001)	( )	( )	( )	( )	( )
14	Using e-mail and the Internet makes me feel part of a community. (χ=3.46; t_{153}=4.981; p<.001)	( )	( )	( )	( )	( )
15	Using e-mail and the Internet is a good way to learn more about different people and cultures. (χ=4.22; t_{153}=17.827; p<.001)	( )	( )	( )	( )	( )
16	Communicating by e-mail is a good way to improve my English. (χ=3.81; t_{153}=10.328; p<.001)	( )	( )	( )	( )	( )
17	Learning to use a computer gives me a feeling of accomplishment. (χ=3.85; t_{154}=12.434; p<.001)	( )	( )	( )	( )	( )
18	**Writing by computer makes me more creative. (χ=3.28; t_{154}=3.221; p=.001)**	( )	( )	( )	( )	( )
19	Using a computer gives me more chances to read and use authentic English. (χ=3.56; t_{154}=7.222; p<.001)	( )	( )	( )	( )	( )
20	I want to continue using a computer in my other classes. (χ=3.87; t_{154}=11.083; p<.001)					
21	(reverse coded) Using a computer is not worth the time and effort. (χ=3.84; t_{153}=9.760; p<.001)	( )	( )	( )	( )	( )
22	Using a computer gives me more control over my learning. (χ=3.39; t_{152}=5.449; p<.001)	( )	( )	( )	( )	( )
23	**I enjoy the challenge of using computers. (χ=3.53; t_{150}=6.563; p<.001)**	( )	( )	( )	( )	( )

24	**Learning how to use computers is important for my career. (χ=4.46; t_{153}=21.874; p<.001)**	( )	( )	( )	( )	( )
25	I can learn English more independently when I use a computer. (χ=3.66; t_{154}=7.870; p<.001)	( )	( )	( )	( )	( )
26	(reverse coded) Computers keep people 'isolated from each other. (χ=2.70; t_{153}=-2.934; p=.004)	( )	( )	( )	( )	( )
27	I can learn English faster when I use a computer. (χ=3.19; t_{151}=2.364; p=.019)	( )	( )	( )	( )	( )
28	Using a computer gives me more chances to practice English. (χ=3.77; t_{152}=10.437; p<.001)	( )	( )	( )	( )	( )
29	**(reverse coded) Computers are usually very frustrating to work with. (χ=3.35; t_{153}=4.500; p<.001)**	( )	( )	( )	( )	( )
30	(reverse coded) Computers make people weak and powerless. (χ=3.47; t_{154}=4.771; p<.001)	( )	( )	( )	( )	( )