

TURKISH AND ENGLISH LANGUAGE TEACHER CANDIDATES' PERCEIVED COMPUTER SELF-EFFICACY AND ATTITUDES TOWARD COMPUTER

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ABSTRACT

The aim of this study is to reveal the relation between the Turkish and English language teacher candidates' social demographic characteristics and their perceived computer self-efficacy and attitudes toward computer. The population of the study consists of the teacher candidates in the Turkish and English language departments at the universities in Cyprus. The sample consists of 136 teacher candidates who were selected according to convenience sampling in Faculty of Education at Cyprus International University. In this study, the "Perceived Computer Self-Efficacy" scale developed by Aşkar and Umay and the "Attitude Toward Computer" scale developed by Aşkar and Orçan were used for collecting data. Considering the purposes of the study percentage documentation average, t-test, ANOVA, Mann-Whitney U, Kruskal Wallis, Scheffe and Pearson Product-Moment Correlation test were used in data analysis. The statistical significance level was accepted as .05 in the study. The result of this study shows that there is a significant difference in teacher candidates' department, age, English proficiency level and socioeconomic level according to the perceived computer self-efficacy whilst according to the attitudes toward computer there is only a significant difference in the English proficiency level. Also, it was determined that there is a medium level positive statistical difference between perceived computer self-efficacy and attitudes toward computer.

Keywords: Perceived computer self-efficacy, attitudes toward computer, self-efficacy, attitudes, Turkish teacher candidates, English teacher candidates,

INTRODUCTION

Motivation, incentives, sense organs, intelligence, age, attention, preparedness, lack of motivation, physical conditions, psychological medium and perceived self-efficacy are among the factors affecting learning. Perceived self-efficacy is a concept in the scope of social learning theory. According to the social learning theory, the most basic motivating structure behind the behaviors of the individuals is perceived self-efficacy. The societies of nowadays require individuals who possess life-long learning talents; in other words, individuals who can continuously renew their knowledge, comply with transformation, follow developments and can produce conscious knowledge. The basic outcome expected from the education institutes is to train self-learning individuals equipped with knowledge and talents, who can manipulate technology (Akkoyunlu & Orhan, 2003).

Perceived self-efficacy is defined as people's beliefs about their capabilities to produce designated levels of performance that exercise influence over events that affect their lives. Self-efficacy beliefs determine how people feel, think, motivate themselves and behave. Such beliefs produce these diverse effects through four major processes. These include cognitive, motivational, affective and selection processes. A strong sense of efficacy enhances human accomplishment and personal well-being in many ways. People with high confidence in their capabilities approach difficult tasks as challenges to overcome rather than as threats to avoid. Such an efficacious outlook fosters intrinsic motivation and deep engagement in activities. They set themselves challenging goals and maintain strong commitment to them. They heighten and sustain their efforts in the face of failure. They quickly recover their sense of efficacy after failures or setbacks. They attribute failure to insufficient effort or deficient knowledge and skills which are to be developed. They approach threatening situations with confidence that they can exercise control over them. Such an efficacious outlook produces personal accomplishments, reduces stress and lowers vulnerability to depression (Bandura, 1994).

Perceived self-efficacy plays a significant role in displaying the students' behaviours and in keeping their motivation high. In perceived self-efficacy success is defined as follows: it is dependent on the interactions between behaviours, personal factors and surrounding conditions. Perceived self-efficacy affects the individual's task selection, effort, patience and success (Schunk, 1984).

In contrast, people who doubt about their capabilities avoid difficult tasks which they view as personal threats. They have low aspirations and weak commitment to the goals they choose to pursue. When faced with difficult tasks, they dwell on their personal deficiencies, on the obstacles they will encounter, and all kinds of adverse outcomes rather than concentrate on how to perform successfully. They slacken their efforts and give up quickly in the face of difficulties. They are slow to recover their sense of efficacy following failure or setbacks. Because

they view insufficient performance as deficient aptitude it does not require much failure for them to lose faith in their capabilities. They fall easy victims to stress and depression (Bandura, 1994).

Perceived computer self-efficacy is defined as “self-judgement of individual regarding computer literacy”. The relevant studies on this topic clearly show that those individuals with high rates of perceived computer self-efficacy are more motivated for participating in computer-related activities in addition to the high level of their expectations from such events. Also, these individuals can much more easily cope with the difficulties they encounter regarding computers (Akkoynlu & Orhan, 2003).

Within the scope of relevant scientific studies, it is mentioned that perceived computer self-efficacy is a significant parameter in using computers (Aşkar, 2001; Işıksal, 2003; İşman & Çelikli, 2009) and various scales were used to measure perceived computer self-efficacy (Harrison & Kelly, 1992; Torkzadeh & Koufteros 1994; Akkoynlu, Orhan & Umay, 2005).

Another important variable affecting computer usage is the attitudes toward the computer itself. Attitude, on the other hand, together with its formation, transformation, causing transformation or their measurement, is a topic relevant to social psychology. In general, attitudes can be defined as a learned predisposition to respond in a consistently favorable or unfavorable manner with respect to a given object. (Fishbein & Ajzen, 1975). They are relatively less stable than personality traits and can be changed both across time and across situations in virtue of individual's interaction with the environment (Robinson, Simpson & Huefner, 1991). From years of prior research in the psychological sciences we know that both positive and negative reactions are reflected in attitudes, which are a key component in predicting behavior (Ajzen, 2001). Thus, to more fully understand computer usage, reactions to computers, and the psychological outcomes associated with computer use it is necessary to assess computer attitudes (Morris, Gullekson, Brendan &. Popovich, 2009). The learner attitude towards computer measures his capabilities in effective learning. Computer attitude has been defined as a person's general evaluation or feeling of antipathy towards computer technology and specific computer related activities (Smith, Caputi & Rawstone, 2000).

Equipping teacher candidates with adequate computer literacy is a significant variable in enhancing the quality of education. Many researchers stated that the attitudes of teacher candidates toward computer are closely related to the effectiveness and efficiency of the education process (Altun, 2003). Within the scope of the studies executed, it was found out that a positive attitude is formed toward computer usage with increased computer literacy (Deniz, 2000), whereas a negative attitude is formed toward computer usage in case of lack of computer literacy (Hashim & Mustapha, 2004). The utilization of computer as a tool of education ought to be an inevitable characteristic of teachers in the current contemporary education approaches. Çavuş and Gökdaş (2006) have also stressed the importance of basic computer skills and education related to the use of internet by the teachers and especially the teacher candidates from the viewpoint of their success in their professions and has as well claimed that this will also lead to effective utilization of computer and Internet.

Within the scope of relevant scientific studies, it is mentioned that attitudes toward computer is another significant parameter to predict behavioral intentions regarding computer use, computer use behaviors (Gerçek & Soran, 2006; Serin, 2011; Kutluca & Ekici, 2010) and various scales were used to measure attitudes toward computer (Aşkar & Orçan, 1987; Morris, A. S., Gullekson, Brendan &. Popovich, 2009).

The aim of this study is to reveal the relation between the Turkish and English language teacher candidates' social demographic characteristics and their perceived computer self-efficacy and attitudes toward computer.

Problem Statements of the Study

The main problem statement of the study is stated as follows: “Is there a relation between the Turkish and English language teacher candidates' social demographic characteristics and their perceived computer self-efficacy and attitudes toward computer?”

Sub Problems

The study aims to answer the following sub problem questions.

1. Is there any statistical difference Turkish and English language teacher candidates' “Perceived Computer Self-Efficacy” and their “Attitudes Toward Computer”?

- a) according to the department?
- b) according to the gender?
- c) according to the age?

- d) according to the English proficiency level (self-perception)?
 e) according to the level of socio-economic parameters (SEP)?
2. Is there a statistically significant relation between Turkish and English language teacher candidates' "Perceived Computer Self-Efficacy" and their "Attitudes toward Computer"?

RESEARCH METHODOLOGY

Research Design

The descriptive type of research was carried out via the descriptive type and is in accordance with the associational research model. This type of research aims to evaluate the degree and the variation between two or more variables (Karasar, 1998).

The Universe and Sample of the Study

The universe of the study consists of the teacher candidates at the universities in North Cyprus. The sample consists of 136 [57.40% (n=78) female, and 42.60% (n=58) male] Turkish and English teacher candidates' who were selected according to convenience sampling in Faculty of Education at Cyprus International University. This number comprises 64 % of the entire students registered to the programs. The information regarding the distribution of the demographic characteristics of the teacher candidates' participating at the research is presented in Table 1.

Research Instruments

Demographic Information Form

This 5-item form is prepared by the researcher to collect data about teacher candidates' department, gender, age, English proficiency level and their socio-economic level.

Perceived Computer Self-Efficacy Scale

The scale for Perceived Computer Self Efficacy was a 18-item and 5-point Likert scale developed by Aşkar and Umay (2001) to define participants' perceived computer self-efficacy. The participants were asked to rate each item on a scale ranging from 1 to 5. The maximum score which could be received from the scale was 90. The Cronbach's alpha reliability coefficient of the scale was calculated to be .71

Attitude Toward Computer Scale

The scale for Attitude Toward Computer Scale was a 24-item and 5-point Likert scale developed by Aşkar and Orçan (1987) to define participants' attitudes toward computer. The minimum and the maximum score which could be received from the scale was 24 and 120 respectively. High scores indicate a positive attitude toward computers. The Cronbach's alpha reliability coefficient of the scale was calculated to be .87.

Table 1. Teacher Candidates' Demographic Characteristics

	Independent Variables	n	%
Department	English	54	39.7
	Turkish	82	60.3
	Total	136	100
Gender	Female	78	57.4
	Male	58	42.6
	Total	136	100
Age	18	7	5.1
	19	10	7.4
	20	32	23.5
English proficiency level	21+	87	64.0
	Total	136	100
	Very Bad	4	2.9
Socio-economic level	Bad	42	30.9
	Average	33	24.3
	Good	33	24.3
	Very Good	24	17.6
	Total	136	100.0
	Less than 1000 TL	20	14.7
	1000-1500 TL	37	27.2
	1501-2000 TL	34	25.0
	2001-2500 TL	18	13.2

More than 2501 TL	27	19.9
Total	136	100.0

Data Analysis

In the statistical evaluation of the research all analyses are performed by using SPSS 15.0 for windows. When the number of individuals included within the scope of the research exceeds 50, it is recommended that Kolmogorov-Smirnov test be utilized for testing whether or not the data obtained from the attitude scales display a normal distribution (Coakes & Steed, 1997; Tabachnick & Fidell, 2000). In the Kolmogorov-Smirnov test, since the statistical null hypothesis states that “the distribution of the grades does not display a meaningful difference from the normal distribution”, the fact that the calculated “p” value exceeds .05 has led to the evaluation that the grades do not display a significant difference from the normal distribution (Büyüköztürk, 2006).

When the Kolmogorov-Smirnov test results are considered, t test and uni-directional variance analysis (ANOVA) tests were applied for the data with a normal distribution; while for the data without a normal distribution, the non-parametric tests Mann-Whitney U test and Kruskal Wallis test were applied. The relation between the dependent variables was calculated by utilizing Pearson moments multiplication correlation coefficient. The significance level was taken as .05 in this study.

FINDINGS

The data obtained from the research were studied and interpreted in accordance with the sub problems.

Comparing the scores obtained from the dependent variables “Perceived Computer Self-Efficacy” and “Attitudes toward Computer”, Kolmogorov-Smirnov test was used to check the convenience of the variables with respect to normal distribution. The results of the analysis are presented in Table 2.

Table 2. Analysis Result Regarding Normal Distribution Test of Dependent Variables

Dependent Variables	Kolmogorov-Smirnov		
	Statistic	df	p
Perceived Computer Self-Efficacy	.075	136	.060
Attitude Toward Computer	.105	136	.001*

* p<0.05 (Non-parametric)

The result of the analysis was found to be Kolmogorov-Smirnov_{Perceived Computer Self Efficacy} = .075 df=136 p=.060; Kolmogorov-Smirnov_{Attitude Toward Computer} = .105 df=136 p=.001. The data regarding perceived computer self-efficacy indicated a normal distribution, whereas the data regarding attitude toward computers did not indicate a normal distribution.

Findings of the First sub-question of the Research

The first sub-question of the research was expressed as “Is there any statistical difference teacher candidates’ Attitudes Toward Computer and Perceived Computer Self-Efficacy according to the department, gender, age, English proficiency level and their socioeconomic level?”

As can be observed in Table 3, t-test has been applied to the data with the aim to determine whether or not there is a significant difference between the mean scores of the dependent variables according to department and gender. As a result of the analysis, it was observed that there is a significant difference between the mean scores for the perceived computer self-efficacy of the teacher candidates’ according to their departments and whereas there is no significant difference according to gender. As can be observed in Table 3, the perceived computer self-efficacy of the English Department teacher candidates’ is better than those of the Turkish Department teacher candidates. When the means regarding gender are evaluated, although it has been found out that the perceived computer self-efficacy of the male teacher candidates was better than those of the female teacher candidates, this difference is not statistically significant.

Table 3. t-Test Results of the Teacher Candidates' Perceived Computer Self-Efficacy According to the Department and Gender.

Independent Variables	n	Mean	Std.Dev.	t	p	Meaningful Difference
Department	English	54	64.037	11.386	2.112	.037
	Turkish	82	59.914	10.973		p<.05
Gender	Female	78	60.448	9.952	1.278	.204
	Male	58	63.034	12.793		p>.05

To determine whether or not there is a significant difference between the perceived computer self-efficacy scores of the teacher candidates' with respect to age, English proficiency and socio-economic level; one directional variance analysis (ANOVA) was applied to the data. As a result of the variance analysis, it was found out that perceived computer self-efficacy was indeed affected by the independent variables age, English proficiency level and their socio-economic level and therefore findings were indeed has significant difference. The descriptive statistics and the ANOVA results related to age, English proficiency and socio-economic level are presented in Tables 4 and 5.

To determine the source groups of significant difference with respect to the variables gender, English proficiency level and socio-economic level, LSD test is applied to the data. As can also be seen in Table 5, the significant difference at the age of 20, 21 and above from the student groups has resulted. This difference is in favor of the ages 21 and above. It was observed that the difference with respect to English proficiency level stemmed from the groups a-b*, a-c*, a-d*, a-e*. On the other hand, it is seen that the difference occurs less than 1000 TL and between 2001-2500 TL groups with respect to socio-economic level.

Table 4. Descriptive Statistics of Perceived Computer Self-Efficacy of the Teacher Candidates' according to Age, English Proficiency Level and Socio-Economic Level

Independent Variables	n	Mean	Std.Dev	SE
Age	18 (a)	56.857	10.761	4.067
	19 (b)	63.900	9.480	2.997
	20 (c)	57.250	9.672	1.709
	21 and 21+ (d)	63.241	11.676	1.251
	Total	61.551	11.280	.967
	Very Bad (a)	49.000	6.377	3.189
English proficiency level	Bad (b)	60.238	9.307	1.436
	Average (c)	59.576	11.393	1.983
	Good (d)	63.515	11.311	1.969
	Very Good (e)	65.958	12.909	2.635
	Total	61.552	11.281	.967
Socio-economic level	Less than 1000 TL (a)	56.550	8.134	1.819
	1000-1500 TL (b)	61.703	10.556	1.735
	1501-2000 TL (c)	59.000	10.759	1.845
	2001-2500 TL (d)	68.778	10.669	2.515
	More than 2501 TL (e)	63.444	13.004	2.503
Total		61.552	11.281	.967

Table 5. ANOVA Test Result of Perceived Computer Self-Efficacy of the Teacher Candidates with respect to Age, English Proficiency Level and Socio-Economic Level

Independent Variable	Source of Variance	Sum of Squares	df	Mean Square	f	p	Meaningful Difference
Age	Between Groups	1049.952	3	349.984			p<0.05 c-d*
	Within Groups	16129.688	132	122.195	2.864	.039	
	Total	17179.640	135				
English proficiency level	Between Groups	1424.759	4	356.190			p<0.05 a-d* a-e* b-e* c-e* d-e*
	Within Groups	15754.880	131	120.266	2.962	.022	
	Total	17179.640	135				
Socio-economic level	Between Groups	1759.182	4	439.796			p<.05 a-d*
	Within Groups	15420.458	131	117.713	3.736	.007	
	Total	17179.640	135				

* Indicates that the difference is in favor of the group.

As can be seen in Table 6, whether or not there was a significant difference between the attitudes toward computer scores with respect to departments were controlled by Mann Whitney U test and it was observed that there is no significant difference between the attitude scores of the two groups (Mann-Whitney U=1951.000 WilcoxonW=5354.000 z=-1.170 p>.05).

Table 6. U-Test Result of Attitudes toward Computer Scores According to Department and Gender

Independent Variable	n	Mean Rank	Sum of Ranks	U	p	Meaningful Difference
Department	English	54	73.37	3962.00		
	Turkish	82	65.29	5354.00	1951.000 .242	p>.05
Gender	Female	78	64.47	5028.50		
	Male	58	73.92	4287.50	1947.500 .166	p>.05

To evaluate whether or not there was a significant difference between attitudes toward computer scores with respect to gender were again controlled by Mann Whitney U test. As a result of the analysis, it was observed that there was no significant difference among the attitude scores of the teacher candidates with respect to gender. (Mann-Whitney U=1947.500 WilcoxonW=5028.500 z=-1.385 p>0.05).

Table 7. Kruskal Wallis Test Result of Attitudes toward Computer of the Teacher Candidates with respect to Age, English Proficiency Level and Socio-Economic Level

Independent Variables	n	Mean Rank	df	X ²	p	Meaningful Difference
Age	18	73.36				
	19	81.35	3	1.325	.723	p>.05
	20	67.75				
English proficiency level	21 and 21+	66.91				
	Very bad (a)	18.50				p<.05 a-b*
	Bad (b)	63.12				
	Average (c)	70.32	4	9.771	.044	a-c* a-d*
	Good (d)	70.58				
	Very good (e)	80.90				a-e*
	24					

Socio-economic level	Less than 1000 TL (a)	20	51.60					
	1000-1500 TL (b)	37	70.54					
	1501-2000 TL (c)	34	61.81	4	9.042	.060		p>.05
	2001-2500 TL (d)	18	85.97					
	More than 2501 TL (e)	27	75.00					

* Indicates that the difference is in favor of the group.

To determine whether or not there is a significant difference between teacher candidates' attitudes toward computer scores with respect to age and socio-economic level, Kruskal Wallis test was applied to the data. As a result of the analysis, it was observed that there was no statistically meaningful difference between the attitudes scores ($X^2_{age}=1.325$ p>0.05; $X^2_{SEP}=9.042$ p>0.05).

To determine whether or not there is a significant difference between teacher candidates' attitudes toward computer scores with respect to English proficiency level is meaningful Kruskal Wallis test was applied to the data. As a result of the analysis, it was observed that there was a significant difference with respect to English proficiency level ($X^2_{English\ proficiency\ level}=9.771$ p<0.05). To determine the source groups of significant difference with respect to the English proficiency level; Mann-Whitney U test is applied to data. As a result of the Mann-Whitney U test, it was observed that the significant difference stemmed from the a-b*, a-c*, a-d*, a-e* groups. This difference was against the teacher candidates' perceiving English proficiency level as very bad.

Findings of the Second sub-question of the Research

The second sub-problem of the research is stated as "Is there a statistically significant relation between Turkish and English language teacher candidates' "Perceived Computer Self-Efficacy" and their "Attitudes Toward Computer?"

The relation between the dependent variables of the research "Perceived Computer Self-Efficacy" and "Attitudes toward Computer" is calculated by the Pearson Product-Moment Correlation test.

Table 8. Pearson Product-Moment Correlation between Perceived Computer Self-Efficacy and Attitudes toward Computer

Perceived Computer Self-Efficacy	Attitudes Toward Computer	
	r	0.535(**)
	p	0.000
	n	136

**p<.001

As is seen in table 8, there is a medium level positive statistically significant difference between perceived computer self-efficacy and attitudes toward computer. With this result, it can be concluded that when the attitudes toward computer or the perceived computer self-efficacy scores of the Turkish Department teacher candidates decrease/increase, a parallel decrease/increase will also be observed in the same scores of the English Department teacher candidates.

DISCUSSION

The aim of this study is to reveal the relation between the Turkish and English language teacher candidates' social demographic characteristics and their perceived computer self-efficacy and attitudes toward computer. The observed findings are discussed comprehensively.

It is seen that there is a significant difference between the perceived computer self-efficacy of the teacher candidates with respect to department, age, English proficiency level and socio-economic level, whereas there exist no meaningful differentiation with respect to gender.

When the perceived computer self-efficacy of the teacher candidates is evaluated according to their departments, it is seen that the perceived computer self-efficacy of the English department teacher candidates' is better than those of the Turkish department teacher candidates. This can be explained by the fact that the majority of the computer commands and information technologies are in English language and also the publishers of the books that are used in English departments provide a lot of additional computer resources whereas this is not true in

Turkish departments. These lead to the self-confidence and motivation of English department teacher candidates.

When perceived computer self-efficacy is examined with respect to age, it is seen that the perceived computer self-efficacy of the teacher candidates' shows an increase with increasing age. This can be attributed by the fact that the experiences of the teacher candidates' increase as they get older. However, since self-efficacy is a variable representing a psychological structure, the result obtained cannot be generalized as it is. For this reason, in case the variables other than the perceived computer self-efficacy which develop with age (experience, improved technological structuring, etc.) are included within the research model and a new study is carried out, different results can be obtained (Akkoyunlu & Orhan, 2003).

On the other hand, when perceived computer self-efficacy is evaluated with respect to gender, it is seen that there is no statistically significant difference. The result is also supported by the findings in the studies conducted by both Gerçek and Soran (2006) and Akkoyunlu and Orhan (2003).

It was observed that there is a significant difference in the teacher candidates' perceived computer self-efficacy with respect to their English proficiency level. This can be attributed by the fact that the teacher candidates with high English proficiency levels feel confident regarding information technologies and terminology and this must have affected their perceived computer self-efficacy.

It is observed that is a significant difference in the teacher candidates' perceived computer self-efficacy with respect to their socio-economic level. The research study of Çetin (2008) related to the perceived computer self-efficacy of Marmara University teacher candidates supports the findings of this study. The high socio-economic level of the individual increases the chance to possess or access the computer. This situation prepares the grounds for the teacher candidates' to increase the perceived computer self-efficacy via increasing the computer literacy.

It is seen that there is a significant difference the teacher candidates' attitudes toward computers according to English proficiency level, whereas there is no a significant difference regarding the attitudes toward computers with respect to department, age, gender and socio-economic level.

It is seen that the teacher candidates' attitudes toward computers do not display a significant difference according to department. When Table 6 is examined, it can be found out that the English Department teacher candidates' attitudes toward computers are comparatively higher than those of the Turkish Department teacher candidates' attitudes toward computers. However, this difference is not statistically significant. The significant difference according to department stems from the teacher candidates' perceived computer self-efficacy, not from their attitudes toward computers.

It is seen that the teacher candidates' attitudes toward computers do not indicate a significant difference according to gender. The previous research studies support the fact that the attitudes toward computers do not display a significant difference according to gender (Güler & Sağlam, 2002; Deniz, 2000; Hunt & Bohlin, 1993).

It is observed that there is no significant difference in the teacher candidates' attitudes toward computers according to their age. The result is also supported by the findings in the study conducted by Gerçek (2006).

It is seen that there is a significant difference in the teacher candidates' attitudes toward computers with respect to English proficiency level. This can be attributed to the same reason related to perceived computer self-efficacy.

It is observed that there is no significant difference in the teacher candidates' attitudes toward computers with respect to their socio-economic levels. The result is also supported by the findings in the study conducted by Atay (2008).

It has been found out that there is a medium level positive statistically significant difference between the perceived computer self-efficacy and the attitudes toward the computer. Busch (1995)'s study examining the relation between the perceived computer self-efficacy and attitudes of university students toward computers also supports this finding. It is necessary to take this relation into consideration while organizing the education facilities. Since cause and effect relation cannot be established in the correlation studies, it is not possible to

discriminate whether attitudes increase self-efficacy or self-efficacy increases attitudes. In order to render this possibility, detailed causative comparisons and experimental studies should be carried out.

CONCLUSION AND RECOMMENDATION

It is observed that there is a significant difference in the perceived computer self-efficacy of the teacher candidates with respect to department, age, English proficiency level and socio-economic level, whereas there is no significant difference with respect to gender.

It is seen that there is a significant difference in the teacher candidates' attitudes toward computer with respect to English proficiency level, whereas there is no a significant difference with respect to department, gender, age, and socio-economic level.

It has been found out that that there is a medium level positive statistical difference between perceived computer self-efficacy and attitudes toward computer.

For the purpose of disseminating the use of computers as a tool of education by the teachers, it is necessary for the teachers, to whichever branch they belong to, to improve their skills related to information technology and computer literacy as well as learning software developed for computer aided language education and to utilize them in various courses.

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