Gülriz İmer
Aynur Yürekli
University of Mersin
gulrizimer@gmail.com
Mersin-Turkiye

TEACHER CANDIDATES' COMPUTER SELF EFFICACY LEVELS FOR SUSTAINABLE DEVELOPMENT

ABSTRACT

In order to improve the existing education faculties' programmes and help to train more qualified teachers, this study aims at investigating the beliefs of computer self-efficacy levels of teacher candidates with different experiences. In this study, the computer self-efficacy belief levels of 296 teacher candidates enrolled in 3 different universities has been investigated. For data collection, an instrument consisting of two sections was used. The first section consists of questions regarding the participants' personal information, computer access opportunities, experience and frequency of use. The findings suggest that teacher candidates' beliefs about their own computer self-efficacy is at an intermediate level. While teacher candidates beliefs about their computer self-efficacy does not differ with respect to gender, it does differ with respect to their study area, computer and internet access opportunities, and frequency of computer and internet use.

Keywords: Computer Self-Efficacy, Teacher Candidates, Teacher Education, Sustainable Development, Competence

SÜRDÜRÜLEBİLİR KALKINMADA ÖĞRETMEN ADAYLARININ BİLGİSAYAR YETERLİKLERİ

ÖZET

Eğitim fakültelerinin programlarının iyileştirilmesi daha kaliteli öğretmenlerin yetiştirilmesi çalışmalarına destek sağlamak amacıyla, bu çalışmada farklı deneyimlere sahip olan öğretmen adaylarının bilgisayar kullanma yetkinlik inançlarının saptanması amaçlanmıştır. Bu araştırmada, üç üniversitede öğrenim gören 296 öğretmen adayının bilgisayar yetkinlik inançları incelenmiştir. Araştırma verilerin toplamak üzere iki bölümden oluşan bir ölçme aracı kullanılmıştır. Ölçeğin birinci bölümünde, araştırmaya katılanların kimlik bilgileri, bilgisayara erişim koşulları, deneyim ve kullanım sıklığına ilişkin sorular yer almaktadır. İkinci bölümünde ise 18 maddeden oluşan Bilgisayar Yetkinlik Ölçeği kullanılmıştır. Araştırma sonuçları öğretmen adaylarının bilgisayara karşı öz yetkinlik inançlarının orta düzeyde olduğunu göstermektedir. Öğretmen adaylarının bilgisayar yetkinlik inançları cinsiyete göre değişmezken, öğrenim gördükleri bölüme, bilgisayar ve internet erişim olanaklarına, bilgisayar ve internet kullanma sürelerine göre değişmektedir.

Anahtar Kelimeler: Bilgisayar Yeterliliği, Öğretmen Adayları, Öğretmen Eğitimi, Sürdürülebilir Kalkınma, Yeterlik

1. INTRODUCTION (GİRİŞ)

For sustainable development, educational activities and the education of the teachers who are going to realize these activities are of great importance. Teachers play the most crucial role in accounting for quality education and reaching educational objectives. Teacher candidates undertake serious roles by training the new generations and making them acquire sufficient knowledge and skills. In order to realize these roles, while fulfilling occupational requirements, teacher candidates need to be equipped with some knowledge and skills. One of the skills that teacher candidates certainly need to possess is the use of computers, which is a necessity of our era. By possessing this skill, teacher candidates will be able to provide their students with more qualified and effective education, which will then lead to sustainability via the transfer of information by each and every teacher they train.

Developing educational software and computer literacy are among the skills and knowledge that teacher candidates enrolled at education faculties need to acquire. This is one of the objectives of education faculties in training qualified teachers. The graduates work in institutions as not only teachers but also experts qualified with the skills of developing educational material. The use of technology is vital for teacher candidates to be successful in their jobs if success is considered to be an ongoing process.

For teachers to meet the requirements and competencies of their occupation, both the quality of their education and their beliefs about the extent to which they think they can fulfil these requirements are important factors (Yılmaz, Köseoğlu, Gerçek and Soran, 2004). In the educational environment, one of the factors of teachers' success and thus the students' success is the self-efficacy level of the teacher. The self-efficacy of the teacher determines the quality of education, the methods and techniques to be used, students' participation in the learning process and the comprehension of students; which directly affects student success (Klausmeıer and Allen, 1978). Thus, teacher candidates are expected to possess high self-efficacy regarding their job more than anything else.

Self-efficacy is one of the variables of the Socio-cognitive theory. According to Bandura, self-efficacy is effective in the formation of behaviour and it is defined "as the individuals own judgement regarding his capacity of how successful he/she thinks he can organize the necessary activities to demonstrate a specific performance (Bandura, 1997).

Bandura's description of self-efficacy in terms of its effects on individual's choice of activities, resistence against difficulties, the extent of efforts and performance has given rise to many studies. According to the findings of these studies, individuals with a high level of self-efficacy put greater effort to succeed, do not give up when faced with difficulties, and are determined and patient. When seen from this perspective, self-efficacy is a feature that needs special focus in education.

As mentioned above, teachers need to possess occupational knowledge, skills and attitudes in fulfilling their different roles. One of the knowledge, skill and attitudes that should be developed in the education of candidate teachers relates to computers and their use. Computers' function in the learning-teaching process is "increasing day by day. Studies suggest that students who took computer courses develop positively in terms of self-efficacy (Downey, 2006; Aşkar and Umay 2001; Chao, 200; Miura, 1997; Cassidy and Eachus, 1995). Individuals with a high level of computer self-efficacy are found to be more willing to participate in computer related activities

and have higher expectations from such studies. In addition, these individuals, when faced with computer-induced difficulties, are better at dealing with those problems. In another study conducted with teacher candidates, it has been highlighted that when teacher candidates see sufficient and appropriate examples of computer use in their practise schools they are more likely to develop their computer self-efficacy (Albion, 2001).

As a result of all these studies, the importance of the experience people get before they start working can be emphasized. It can be said that experienced people, especially teachers, will help to spread the use of computers in the learning-teaching process as long as they possess a high level of computer self-efficacy. Besides, it is pointed out that computer self-efficay is one of the key factors determining the computer use (Compeau ve Higgins, 1995). According to the socio-cognitive theory, an individual's self-efficacy is nourished from four sources, which are;

- The individual's personal experience or the knowledge the person gained during the efforts towards acquiring a skill, ,
- Other's experience (taking role models or sharing experience),
- Verbal persuasion, advise that a person receives in dealing with a challanging situation,
- Emotional state, an individual's control over fear, anxiety and stress while evaluating one's efficacy.

Many similar studies, point out that self-efficacy is affected by experience and outside models, which in turn affects the quality and sustainability of computer use. This mutual effect plays a leading role in the organization of the educational process.

Computer self-efficacy, which is the center of this study, is defined as "the individual's self-judgement regarding computer use" (Karsten and Roth, 1998). Individuals with a high level of computer self-efficacy are found to be more willing to participate in computer related activities and have higher expectations from such studies. In addition, these individuals, when faced with computer-induced difficulties, are better at dealing with those problems (Karsten and Roth, 1998; Compeau and Higgins, 1995; Hill, Smith and Mann, 1987).

Other studies related to computer self-efficacy investigated whether factors such as gender, experience, access conditions, frequency of use, demographic characteristics play an important role in computer self-effcicacy. Among these studies, a significant relationship between gender and computer self-efficacy was found. While one study (Miura, 1987) suggests that male undergraduate students have a higher level of computer self-efficacy when compared to female students, another study (Murpy, Coover and Owen, 1989) claims that there is no significant difference in terms of computer self-efficacy between male and female beginner level computer students. Another study (Torkzadeh and Koufteros, 1994) points out that there is no significant difference between beginner level male and female computer students in terms of self-efficacy, however regarding software development and skills related to computer languages, male students exhibited a higher level of computer self-efficacy. Studies investigating the relationship between experience and computer self-efficacy indicate that students' level of computer self-efficacy rises throughout their education (Torkzadeh and Koufteros, 1994). Hill et al (1987), in their research, found that while students' computer self-efficacy level increases based on experience, positive experience leads to positive effect on computer self-efficacy and negative experience leads to a negative effect on computer self-efficacy.

2. RESEARCH SIGNIFICANCE (ÇALIŞMANIN ÖNEMİ)

Based on the studies mentioned, this study attempts to determine the computer self-efficacy levels of teacher candidates enrolled at different departments of three different universities. Derived from this main aim, the answers to the following research questions will be answered:

- What is the level of computer self-efficacy of the teacher candidates?
- Do teacher candidates' level of computer self-efficacy change with respect to gender?
- Do teacher candidates' level of computer self-efficacy change with respect to computer access possibilities?
- Do teacher candidates' level of computer self-efficacy change with respect to the department that they are enrolled at?
- Do teacher candidates' level of computer self-efficacy change with respect to their use of computer in terms of hours per day?
- Do teacher candidates' level of self-efficacy change with respect to their use of internet in terms of hours per day?

3. MATERIALS AND METHODS (ÖLÇME ARAÇLARI VE YÖNTEM)

This is a descriptive study. The sample group consists of 296 teacher candidates currently enrolled at three different universities. Table 1 shows the characteristics of the teacher candidates.

Table 1. Teacher candidates' destribution in terms of gender and department
(Tablo 1. Öğretmen adaylarının cinsiyet, bölümlerine göre dağılımı)

Gender		Departmens					
Female	Male	Elt	Maths. Edu.	Science Edu.	Primary Edu.	Pre-School	Turkish
189	107	66	30	34	55	61	50

As can be seen in Table 1, 189 of the participant teacher candidates are female (%63.9), and 107 (36,1%) are male. The teacher candidates who participated in this study are enrolled in 6 different departments. 66 of the participant teacher candidates are enrolled in English Language Teaching (ELT), 30 of them enrolled in Teaching Mathematics (Maths Edu.), 34 enrolled in Teaching Science (Science Edu.), 55 in Primary School Teaching (Primary Edu.), 61 in Pre-school Teaching (Pre-school edu.) and 50 in Teaching Turkish. Table 2 demonstrates participant teacher candidates' computer and internet access possibilities.

Table 2. Teacher candidates' destribution in terms of computer and ınternet access possibilities
(Tablo 2. Öğretmen adaylarının bilgisayar ve internet erişim olanaklarına göre dağılımı)

COMPUTER ACC.		INTERNET ACC.		COMPUTER USE			INTERNET USE		
YES	NO	YES	NO	1-2	3-4	5+	1-2	3-4	5+
1	160	144	152	190	57	49	189	54	53

As Table 2 shows, 136 of the teacher candidates (45,9%) have a computer whereas 160 (54.1%) do not. 144 of the participants have indicated that they have access to internet, yet 152 of them said they have no access to internet. Among the participants, 190 indicated that

they use the computer 1-2 hours a day, 57 said they use it between 3-4 hours, and 49 said they use it more than 5 hours a day. Furthermore, 189 participants indicated that they accessed the internet for 1-2 hours a day, 54 said they use internet between 3-4 hours, and 53 said they use internet more than 5 hours a day.

The Scale used in this study to elicit "Compuer Self-Efficacy" was developed by Aşkar and Umay (2001). The scale consists of two parts. The first part elicits personal information about the participants, the second part consists of 18 items related to computer use. The scale, which consists of 18 items, is designed in 5 point Likert Type Scale where positive items are labelled from "Always-5 to Never-1, and negative items are labelled from "Always-1 to Never 5". As a five point scale is used, the coefficients (4/5=80) for the 4 intervals (5-1=4) are: Never, 1.00-1.79, Rarely 1.80-2.59, Sometimes 2.60-3.3.39, Often 3.40-4.19 and Always 4.20-5.00.

The reliability calculations of Cronbach Alpha Coefficient for the scale was found to be 0,71. For this study, the reliability studies referred to 0.72 Cronbach Alpha Coefficient. As the values are consistent with the one found by Aşkar and Umay, the scale was chosen as the data collection instrument for this study.

In the analysis of the data, SPSS was used. The aim. Besides, t-test was computed to understand whether there is a meaningful difference between teacher candidates' level of computer self-efficacy and participants' gender, computer and internet access. ANOVA was computed to see whether there is a meaningful difference in teacher candidates' computer self-efficacy levels with regards to their departments, and frequency of computer and internet use. In cases where there was a meaningful difference, Tukey HSD test was carried out, and interpretations were based on these results. The level of significance was taken as 0.05.

4. RESULTS AND DISCUSSIONS (SONUÇ VE TARTIŞMA)

The findings and discussions will follow the questions mentioned; first teacher candidates' level of computer self-efficacy will be pointed out, then the findings regarding participants' level of computer self-efficacy in relation to gender, department, computer and internet access possibilities and frequency of computer and internet use will be discussed.

- **Teacher Candidates' Level of Computer Self-efficacy:**

The main research question was to determine teacher candidates' level of computer self-efficacy. The findings for each item on the scale are shown in Table 3.

Table 3 shows teacher candidates' computer efficacy level with respect to arithmetical averages and standard deviations for each item on the scale. The item score averages and standard deviations of the answers given by the participant teacher candidates are 2,51 and ,459, respectively. According to this result, it can be said that teacher candidates' self-efficacy is not quite high. Obviously, average corresponds to the neutral alternative of "Sometimes-3". Based on this, it can be suggested that teacher candidates' computer self-efficacy level is average. One of the most effective results in this study is related to the answers given for the item "If I try hard enough, I can solve computer related problems".

The average of the responses given to this item is 3.60. This score average corresponds to the "Often" choice of the intervals used in the study. Thus, it can be suggested that teacher candidates have self-confidence in computer related issues.

Table 3. The ıtem distribution of the averages and standard deviations
of the answers given to the scale
(Tablo 3. Ölçeğe verilen yanıtların ortalama ve standart sapmalarının
maddelere göre dağılımı)

ITEMS	N	Items Mean	Mean	Std. Dev.
I believe that I have a special talent in using computers.	296	2,7061	42,6496	1,27483
I am talented in using computers.	296	2,9797	42,3723	1,13776
I feel talented in front of the computer.	296	3,0405	42,3029	1,08223
If I try hard enough, I can solve computer related problems.	296	3,6014	41,7774	1,04307
If I face a new situation related to computers, I know what to do.	296	2,8818	42,4854	1,07807
It easy for me to write any type of document on computer.	296	3,3108	42,0730	1,15481
I feel the fear of doing something wrong/pressing the wrong key while using the computer.	296	1,9088	43,7117	1,11771
I have the feeling that it is impossible for me to grasp the computer thoroughly.	296	1,8074	43,4672	1,06727
I feel uneasy while working on the computer.	296	1,6824	42,5255	,97798
Computers leave me in the middle of nowhere.	296	1,9122	42,5511	,94549
When faced with a problem while working on the computer, temporary solutions are enough for me.	296	2,8311	43,3175	1,00769
I believe that I am competent in computer terminology and concepts.	296	2,8007	43,5584	1,14276
I feel that the computer is a part of me.	296	2,0541	42,3613	1,22562
While planning my day/time, I use the computer.	296	1,8176	43,1241	1,10798
I surf on the computer and make new inventions.	296	2,8176	43,5547	1,16175
I believe that I can use the computer effectively.	296	2,9932	42,3613	1,17889
I panic when I face an unexpected problem on the computer.	296	2,2500	43,1241	1,11614
Most of the time I spend in front of the computer can be considered waste.	296	1,8041	43,5511	1,00277
AVERAGE	296	2,5111		,45944
Total	296		45,1993	8,269

Another striking and effective result concerns the answer
average given to the item "I feel uneasy while working on the
computer". The average of the answers given to this item is 1.68. This
score average corresponds to the "Never" choice of the intervals used
in the study. So, it can be said that teacher candidates do not feel
uneasy while using computers, just the opposite, they enjoy it.

As mentioned earlier, research shows that self-efficacy is
affected by the individual's experience, the models in the
environment, which in turn affects the quality and sustainability of
computer use. Further it has been pointed out that this is a two-way

process. When teacher candidates' computer experience and frequency of use are taken into account, it is an expected result that their computer self-efficacy level is at an average level. This finding is also in accordance with the responses that teachers gave regarding computer use.

- **Do teacher candidates' level of computer self-efficacy change with respect to gender?**

The second research question of the study aimed at finding out whether teacher candidates' computer efficacy level changes with respect to gender. Thus, teacher candidates' computer efficacy level was investigated in terms of gender. The literature suggests that there are studies which found a difference resulting from gender, whereas others found that computer effcacy level does not change when gender variable is taken into account. Does gender really affect computer self efficacy? The results are shown in Table 4.

Table 4 suggests that there is no difference between male and female teacher candidates' computer self-efficacy level. Some studies in this area point out to no difference between male and female participants, whereas others refer to a difference between male and female participants when skills such as software development are concerned. While the study by Miura (1987) claims that male undergraduate students have a higher level of computer self-efficacy than female students, the study by Murpy, Coover and Owen (1989) conducted with beginner computer students refers to no meaningful difference. In another study (Torkzadeh and Koufteros, 1994), it was found out that male students have a higher level of computer self-efficacy in the skills of software development computer languages. The findings of this study support the literature in that gender has not come out as a determining factor for computer self-efficacy.

Table 4. Computer self-efficacy and gender
(Tablo 4. Bilgisayara ilişkin yeterlikleri ve cinsiyet)

SEX	N	Mean	Std. Deviation	t	Sig(2-tailed)
Female	189	44,8466	7,97688	-,975	,330
Male	107	45,8224	8,76723		

- **Do teacher candidates' level of computer self-efficacy change with respect to computer access possibilities?**

One of the aims of this study was to determine the relationship between teacher candidates' computer self-efficacy levels and their familiarity with the computer. Despite the fact that the teacher candidates took computer courses in their undergraduate programmes, personal access possibilities to computer might also have an effect on their computer self-efficacy. Thus, the relationship between computer self-efficacy and computer access possibilities was investigated. The results are demonstrated in Table 5.

Table 5 shows the t-test results which indicate whether there is a difference between the computer self-efficacy levels of teacher candidates who have computer access possibilities and the ones who do not. The results refer to a meaningful difference between the computer self-efficacy level of teacher candidates who do have access to computers and the ones who lack this possibility. Teacher candidates who have access to computers have a higher level of computer self-efficacy. This finding supports the results of other studies which indicate that the computer self-efficacy level is higher in individuals who use the computer more frequently.

Table 5. Computer self-efficacy and computer access
(Tablo 5. Bilgisayara ilişkin yeterlikleri ve bilgisayar erişim
olanakları)

Computer Access Possibility	N	Mean	Std.Devi.	t	sig.(2-tailed)
YES	136	48,5221	8,6760		
NO	160	42,3750	6,7458	6,85	000

Research indicates that the computer self-efficacy level of students who take computer courses and use the computer more frequently develops in a positive way (Downey, 2006; Aşkar and Umay 2001; Chao, 200; Miura, 1997; Cassidy and Eachus, 1995). It is being highlighted that computer self-efficacy level is a determining factor in computer use (Compeau and Higgins, 1995). According to the socio-cognitive theory, an individual's personasl experience or the attempts towards acquiring a skill causes self-efficacy level to increase.

- **Do Teacher Candidates' Level of Computer Self-efficacy Change with Respect to Internet Access Possibilities?**

This study also tried to find out whether the computer self-efficacy levels of teacher candidates changes with respect to internet access possibilities. Internet offers wide possibilities which are being widely used throughout the world. The teacher candidates who participated in this study are also expected to make use of these possibilities. Based on the expectation that internet use would increase teacher candidates' use of the computer, a possible relationship was investigated. The findings are displayed in Table 6.

Table 6. Computer self-efficacy and ınternet access
possibilities
(Tablo 6. Bilgisayara ilişkin yeterlikleri ve ınternet erişim
olanakları)

Internet Access Possibility	N	Mean	Std.Deviation	t	sig.(2-tailed)
YES	66	49,5455	8,3871		
NO	152	44,5000	8,2758	4,11	,000

Table 6 shows the t-test results which indicate whether there is a difference between the computer self-efficacy levels of teacher candidates who have internet access possibilities and the ones who do not. The results refer to a meaningful difference between the computer self-efficacy level of teacher candidates who do have access to internet and the ones who lack this possibility.

There is a parallelism between individuals' internet use and access possibilities and the skill of using computers. Thus, the answer to the previous research question of this study is supported.

- **Do teacher candidates' level of computer self-efficacy change with respect to the department that they are enrolled at?**

Another aim of this study was to investigate the relationship between teacher candidates' self-efficacy level and the department they are enrolled at. The aim was to determine whether their department plays an important role in assigning the teacher candidates' computer efficacy levels. The teacher candidates, depending on their departments, might more engaged with computer or just the opposite. Table 7 and 8 demonstrate the results regarding departments and efficacy levels.

Table 7. Computer self-efficacy and departments of participants
(Tablo 7. Bilgisayara ilişkin yeterlikleri ve öğrenim gördükleri bölümler)

	DEPARTMENTS	N	Mean	Std. Deviation
1	English Language Teaching	66	47,3939	7,31464
2	Teaching Mathematics	30	44,0000	7,35754
3	Teaching Science	34	45,1429	8,65613
4	Primary School Teaching	55	46,8182	9,19156
5	Pre-school Teaching	61	43,3115	7,40842
6	Teaching Turkish	50	42,5185	9,06969
	TOTAL	296	44,6800	8,43085

Table 7 shows the results of one-way variance calculations aimed at identifying whether there is a significant difference in teacher candidates' computer self-efficacy levels and the departments they are enrolled at. The results refer to a meaningful difference between self-efficacy levels and departments. To identify the source for difference, Tukey HSD test was carried out. Table 8 displays the results.

Table 8 indicates that the difference results from the teacher candidates studying in the English Language Teaching Department. When compared to English Language Teaching Department candidates, the computer self-efficacy levels of the participants enrolled at Pre-school Teaching and Teaching Turkish are much lower.

Table 8. Variance analysis for computer self-efficacy and departments of participant
(Tablo 8. Bilgisayar ilişkin yeterlikleri ve öğrenim gördükleri bölümler arasındaki farkın varyans analizi)

	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	910,02	2	151,671	2,275	,037
Within Groups	192265,214	289	66,662		
TOTAL	201175,240	295			

- **Do teacher candidates' level of computer self-efficacy change with respect to their use of computer in terms of hours per day?**

Another factor in this research was to investigate whether the daily amount of time that teacher candidates spend with computer affects their computer self-efficacy level. Based on the expectation that the more time teacher candidates spend with computer would make them more confident in dealing with problems, and thus increase their level of self-efficacy, the results in Table 9 and 10 were obtained.

Table 9. Computer self-efficacy and the amount of time spent with computer
(Tablo 9. Bilgisayara ilişkin yeterlilikleri ve bilgisayar kullanma süresi)

HOURS	N	Mean	Std. Deviation
1-2 hrs	190	44,2263	6,81551
3-4 hrs	37	51,6486	7,86771
5 hrs and above	14	54,7857	11,25357
TOTAL	241	45,9793	8,03972

Table 9 shows the results of one-way variance analysis computed to find out whether teacher candidates' computer self-efficacy levels

is affected by the amount of time the participants spend daily with the computer. The results suggest that there is a meaningful relationship between the amount of time spent with computer and the teacher candidates' computer self-efficacy level. To identify the source for difference, Tukey HSD test was carried out. The results obtained are shown in Table 10.

Table 10. Variance analysis for computer self-efficacy and the amount of time spent with computer
(Tablo 10. Bilgisayar ilişkin yetkinlik inançları ve bilgisayar kullanma sürelerinin arasındaki farkın varyans analizi)

	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	2858,838	2	1429,41	26,885	,00
Within Groups	12654,058	238	53,168		
Total	15512,896	240			

According to Table 10, the difference results from the teacher candidates who indicated that they use the computer 3-4 hours or above 5 hours a day. The increase in the amount of computer using time caused an increase in the teacher candidates' computer self-efficacy levels. This finding supports the findings of other studies in this area. In the increase of computer self-efficacy level, individuals' computer skill developments and the time they spend with computers play a crucial role.

- **Do teacher candidates' level of self-efficacy change with respect to the amount of time spent on the internet?**

The last research question aimed at finding out whether there is a difference between teacher candidates' computer self-efficacy level and the daily amount of time they spend on the internet. As internet use automatically requires the use of computer, it is thought that it would affect teacher candidates' computer self-efficacy level positively. Table 11 and 12 show the results related to internet use and self-efficacy.

Table 11. Self-efficacy and the amount of time spent on the ınternet
(Tablo 11. Bilgisayar yetkinlik düzeyleri ile internet kullanım süresi)

HOURS	N	Mean	Std. Deviation
1-2 hours	189	44,8942	7,27203
3-4 hours	19	54,0526	8,07241
5 and above	13	51,5385	10,63497
Total	221	46,0724	8,07151

Table 11 shows the results of the one-way variance analysis carried to see whether there is a difference between computer self-efficacy level and the amount of time teacher candidates spend on the internet. According to the results, there is a significant difference between teacher candidates' computer self-efficacy level and the amount of time they spend on the internet. The results of Tukey HSD test conducted to identify the source for the difference is shown in Table 12.

Table 12. Variance analysis for computer self-efficacy and the amount
of time spent on the ınternet
(Tablo 12. Bilgisayar yeterliliği ve internette harcanan zamana
ilişkin varyans analizi)

	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	1860,780	2	930,390		
Within Groups	12472,062	218	57,211	16,262	,000
Total	14332,842	220			

Table 12 demonstrates that the source for the difference is caused by the participants who indicated that they used the internet 3-4 hours or more than 5 hours.The teacher candidates who use the internet frequently exhibited a higher level of computer self-efficacy than the ones who use it only 1-2 hours a day. This finding is paralel with the results of the fifth research question. It is a natural result that individuals who use the computer frequently in their daily life, also have a higher level of computer self-efficacy. Individuals with higher level of computer self-efficacy are found to be more willing in participating in computer-related activities, and their expectations are higher. Besides, these individuals, when faced with difficulties related to the computer, are able to overcome them more easily. A study carried out with teacher candidates also points out that the use of computer in classes and sufficient and appropriate use of computers in the practise schools affects the level of computer self-efficacy positively (Albion, 2001).

Individuals with high level of self-efficacy put great effort to succeed, do not give up when faced with problems, insist and show determination in what they are doing.

It is quite important for teacher candidates to have high levels of computer self-efficacy when we consider that they will be expected to increase their students' computer literacy as well as use computer during their teaching. This is especially important if we want teachers to transfer their knowledge and skills to the upcoming generations, which is one of the key factors for sustainability in education.

The results of this study suggest that the teacher candidates who participated in this study have an average level of computer self-efficacy. This shows that these teacher candidates, after starting to teach in their schools, will encounter some problems in their studies with computers. To overcome potential difficulties and help assist them in computer use, their computer skills need to be developed. To reach this aim, courses related to computers need to be integrated into the programme, the hours of the existing ones need to be increased and these courses need to be organized with care. Teachers, who form the most important occupation group for sustainable development, have to be trained in computer technologies.

Even though teacher candidates' level of computer self-efficacy does not change with regards to gender, it does show changes with respect to their departments, amount of time they spent with computers or on the internet, and the computer and internet access possibilities that they have at hand. Along with the increase of the amount of time teacher candidates spend on the internet or with the computer, their level of computer self-efficacy increases, which can be explained with the increase in their experience.

In conclusion, the results of this study are important in the sense that they show us the degree of teacher candidates' self-efficacy in using computers. To account for sustainability in

education, the ones who are going to train the next generations, have to be as well equipped as possible, so that the next generations do not encounter similar problems when faced with new Technologies, computers in this respect. Offering teacher candidates more opportunities to experience with computers and giving them enough chances to develop their related skills, should be one of the main objectives of teacher training programmes.

REFERENCES (KAYNAKLAR)

- Albion, P., (2001). Some factors in the development of self-efficacy beliefs for computer use among teacher education students. Journal of Technology&Teacher Education, 9/3, 321-348.
- Aşkar, P. and Umay, A. (2001). İlköğretim Matematik Öğretmenliği öğretmen adaylarının bilgisayarla ilgili öz- yeterlik inançları. Hacettepe Üniversitesi Eğitim Fakültesi Dergisi, 21, 1-8.
- Bandura, A., (1997). Self-efficacy: The Exercise of Control. Newyork: Freeman.
- Cassidy, S. and Eachus, P., (1995). Developing the computer self-efficacy scale: Investigation the reletionship between CSE, gender&experience with computers. http:// www.chssc.salford.ac.uk, September,2001
- Compeau, D.R. and Higgins, C.A., (1995). Computer self-efficacy: development of a measure&inital test. MTS Quarterly, June
- Hill, T., Smith, N.D., and Mann, M.F., (1987). Role of efficacy expectations in predicting the decision to use advanced technologies: The case of computers. Journal of Applied Psychology, 72 (2), 307-313.
- Karsten, R. and Roth, M.R., (1998). the relationship of computer experience and computer self-efficacy to performance in introductory computer literacy courses. Journal of Research on Technology Education, 31 (1), 14-24.
- Klausmeier, H.S. and Allen, P.S., (1978). *Cognitive development of children and youth: a longitudinal study*. Newyork: Academic Press.
- Miura, T., (1987). The relationship of computer self-efficacy expectations to computer interest and course enrolment in college, Sex Roles, Vol.16 (5/6).
- Miura, T., (1997). Computer self-efficacy: A factor in understanding gender differences in computer course enrollment. Paper presented at the Annual Meeting of the American Educational Research Association, San Francisco, April:16-20.
- Murpy, C., Coover, D., and Owen, S., (1989). Development and validation of the computer self-efficacy scale. Education and Psychological Measurement, Vol. 49, 893-899.
- Torzadeh, G. and Koufteros, X., (1994). factorial validity of a computer self-efficacy scale and the impact of computer training, Education and Psychological Measument, Vol, 54(3), 813-821.
- Yılmaz, M., Köseoğlu, P., Gerçek, C., and Soran, H., (2004). Öğretmen öz-yeterlik inancı. Bilim ve Aklın Aydınlığında Eğitim Dergisi, 58.