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Pre-service English teachers' perceptions of web-based assessment in a pedagogical content knowledge course

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Abstract

Many e-learning experts and educational technologists have emphasized that e-assessment can play an important role in improving the quality of student learning experiences, particularly in higher education. However, there still seems to be a need for investigating what students think and feel, and learning context-specific issues. This study examined pre-service English teachers' perceptions of web-based assessment within the methods and approaches course they took in an English teacher training program at a large state university in Ankara. It also aimed to explore individual differences by gender and the time spent using the Internet, as well as the relationship between their GPAs and perceptions. Fifty student teachers enrolled in a content knowledge course rated the statements in a five-point Likert scale. The qualitative data was also collected through interviews. The results indicated that although the participants did not seem to fully appreciate the use of web-based assessment and showed some lack of interest to use this form of assessment in their future classes, they displayed a positive computer attitude and positive perception towards ease of use of web-based testing for their course. They did not favor a shift to a fully web-based form of assessment, but more students preferred a web-based assessment in combination with paper-based assessment than having only paper-based tests. Factors such as frequency of internet usage and level of computer literacy were also found to have significant impact on the students' attitudes towards web-based assessment.

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Keywords: Web-based Assessment; Perceptions; Pre-service English Teachers; English Teacher Education;

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1. Introduction

Over the past two decades developments in computer speed and accuracy have accelerated the use of computer technology in many areas of education. Educational institutions have increasingly come to rely on online systems of instruction and assessment. Therefore, educators emphasize the need for aiding administrative efficiency, increasing the frequency of assessment, extending the range of assessment methods 'through computer-aided instruction' and increasing objectivity and consistency among many pedagogical issues (Bull and McKenna, 2004, p.3). Furthermore, developments in Information and Communication Technologies (ICT) have contributed to the growing popularity of web-based assessment as an alternative method of test administration for both formative and summative assessment purposes. In general, web-based assessment refers to the online "use of computers to deliver, mark and analyze assignments or examinations" (Bull and McKenna, 2004, p.1). Other terms used to describe the application of computer technologies to the process of assessment are computer-assisted assessment, computer-aided assessment, online assessment, e-assessment, and computerized assessment (Bull and Danson, 2004; JISC, 2007; Bull and McKenna, 2004). The umbrella term associated with any form of computerized assessment is usually computer-assisted assessment (CAA). Even though authors may have some individual interpretations of the terminology, "the underlying strategies and practices for making effective use of computers for student assessment remain constant" (Bull and Danson, 2004). As mentioned above, these terms are used interchangeably in the literature; however, in the present study the term web-based assessment is used as a general concept of computer-assisted assessment.

Experts and educational technologists underline that web-based assessment plays an important role in improving the quality of student learning experiences, particularly in higher education (Bull, 1999; JISC, 2007; Bull & McKenna, 2004; Conole and Warburton, 2005; Saricoban, 2013). This thinking is motivated by the fact computer knowledge has become not only an integral part of everyday life for most people but almost requirement in higher education as well. Furthermore, web-based assessment tools are now a well-established component or module of learning management systems (LMS) (Myrick, 2010). A lot of studies have been carried out regarding the development and application of web-based instruction and assessment. However, studies focusing on what students think, feel and learn context-specific issues have remained scarce. In fact, it is necessary to investigate such factors that are likely to influence students' intention towards usage of such an assessment mode (Davis, 1989; Davis, Bagozzi and Warshaw, 1989). In addition, most studies have been conducted either in other countries or with students enrolled in programs other than English language teaching (e.g. Akdemir and Oğuz, 2008; Bonham, Titus, Beichner and Martin, 2000; Davidson-Shiver, Adkinson and Jackson, 2008; Costa, Mullan, Kothe and Butow, 2010; Dermo, 2009; Jamil, Topping and Tariq, 2012). In Turkey, while every English language teaching (ELT) department offers a course in computers and universities are beginning to implement e-learning practices via tools such as *Blackboard* and *Moodle*, there is currently no empirical study that deals with pre-service English teachers' perceptions of the test administration mode under discussion. Thus, the present research aimed to address this issue by investigating the pre-service English teachers' perceptions of web-based assessment within the language teaching methods and approaches course that they took in an ELT department at a large state university. Specifically, the researcher felt motivated to examine their general perceptions regarding this type of test mode, their preferences for computer-based and paper-based tests and relationships among some factors.

2. Literature review

The implementation of web-based assessment by educational institutions in the past decade led to numerous studies from various parts of the world. For example, Akdemir and Oğuz (2008) examined the impact of computer-based assessment by comparing the computer- vs. paper-based test scores of Turkish undergraduate students enrolled in the departments of Primary School Teaching and Turkish Language and Literature. Their findings did not reveal any significant difference between the students' scores, which showed that web-based testing is a convincing alternative to paper-based tests. Another study by Costa *et al*. (2010) found web-based learning and assessment tools to be an appropriate assessment method for master students in psychology.

Over the past two decades, web-based assessment has remained a significant subject of such research areas. Some practitioners continue to express their concerns regarding the drawbacks of using this form of assessment.

According to Akdemir and Oğuz (2008), the limitations of computer testing hardware and software may pose problems with computer-based assessment. It is not enough to simply change the test administration mode; the administrators need to adapt the tests to suit computer testing hardware and software capabilities. Another disadvantage of this method is the lack of flexibility and judgment of computers especially in dealing with partially correct answers (Bull and McKenna, 2004). Limitations on the type of assessment questions and answers are another issue raised by the authors. For example, web-based assessment would not be able to rate testing formats that allow students to express their thoughts such as essays. According to Bull and McKenna (2004) the objective-type format used in web-based assessment can be "disempowering" because it makes students inactive participants of the process (p.18). Students may lose the opportunity to interpret the question or raise alternative ideas as they are usually confined to a given set of answers.

On the other hand, educators supporting web-based assessment maintain that its advantages outweigh its shortcomings. Web-based assessment allows timely feedback of students' work, which could be a challenging task in large classes (Bonham *et al*., 2000; Bull and McKenna, 2004). Furthermore, it enables more frequent administration of assessment, which is more motivating and encouraging on the part of the students (Bull and McKenna, 2004). Other advantages include assessment of broader range of knowledge and skills, use of various assessment approaches, higher objectivity and consistency, lower grading load and better administrative efficiency for educators (Bull and McKenna, 2004; Bull and Danson, 2004). Bull and McKenna (2004) also state that the sophistication and capability of computers make them more reasonable assessment medium than paper-based formats because they allow more interactive ways of student expression such as the use of "computer graphics, simulation, film" and others (p.18).

Some studies reported that students' attitudes as well as perceptions about web-based assessment are influenced by such different factors as age, gender, literacy, frequency of usage and others. As far as gender is concerned, Akdemir and Oğuz (2008) found that the performance of male and female participants did not differ in both the computer- and paper-based test administration modes. Dermo (2009) also demonstrated that attitudes of male and female students towards the use of web-based assessment did not differ significantly. This contradicts Jamil *et al*.'s (2012) finding that female students demonstrated higher levels of interest in online testing than their male counterparts and the difference was statistically significant. Regarding the frequency of computer use, Wong, Wong and Yeung (2001) found correlation between frequency of use and test scores, but they noted that the higher scores might be due to the students' "diligence" rather than the duration of usage of the system. The present study further explores this issue by examining the impact of grade point average (GPA) on the students' perception of web-based assessment.

Computer literacy, computer anxiety and attitude are important issues that need to be taken into consideration when practicing online assessment. According to Akdemir and Oğuz (2008), computer experience and competency could affect the scores and confidence in undergoing computer-based testing. Although they did not investigate this factor in their study, they suggested the inclusion of computer literacy level in future studies, which the present study actually addressed. Similarly, computer anxiety could have a vast impact on the attitude towards computer-based assessment (Davidson-Shiver *et al*., 2008). They reported that lack of computer experience increase computer anxiety. Their study also indicated that females tend to be more anxious about the use of technology than males. Regarding computer attitude, Wong, et al.'s (2001) study revealed that a higher proportion of students believe that web-based assessment is an effective and interesting means of testing. By the same token, Jamil *et al*.'s (2012) results are consistent with the findings of Dermo (2009) that students have predominantly positive attitude towards computer-based assessment. However, the study revealed that student groups from the departments of Biology, Commerce, Education and Mathematics were more accepting of this test mode than those from other departments. Differences were also obtained between the various universities studied. This finding supports Bull and McKenna's (2004) argument that the effectiveness of the assessment approaches employed depends on specific skills and abilities being measured. This suggests that there might be instances where the traditional test delivery mode is more suitable than computer-based form. Finally, Wong *et al.*'s (2001) study found that most students view web-based testing as a useful method of assessing students' learning outcomes. Along with other factors such as intention, and perceived ease of use, this topic of perceived usefulness is explored further in the current study.

The review of related literature shows that although there are numerous studies that investigate the effects of implementing computer-assisted tests, there is little research on students' general attitudes and perceptions about web-based assessment. Furthermore, at a time when Turkish institutions in tertiary education are introducing e-learning and e-assessment systems (Demiray, 2011), there is not even a single study dealing with pre-service English teachers' perceptions of web-based assessment system in English teacher education programs. Thus, the present research grew out of a desire to investigate student teachers' perceptions of web-based assessment within a pedagogical content knowledge course they took in an ELT department at a large state university. For this purpose, this study was designed to address the following research questions:

1. What are the pre-service English teachers' general perceptions of web-based testing for their course?
2. Do the pre-service English teachers prefer computer-based tests over paper-based tests?
3. Do gender, duration and frequency of internet usage and level of computer literacy affect the pre-service English teachers' perceptions of web-based assessment?
4. Does the pre-service English teachers' intention towards web-based assessment relate to (a) perceived usefulness, (b) perceived ease of use, (c) computer attitude, and (d) anxiety?

These questions were addressed primarily by using quantitative analysis of data drawn from student teachers in an ELT department at a state university. In this study, it is expected that since ELT departments have not integrated a complete online assessment system of the learning outcomes yet, investigating student teachers' perceptions of the test administration mode under discussion will provide beneficial data for teacher training programs at Turkish universities.

3. Methodology

3.1. Research design

Given the time and resource limitations, the current study primarily employed a quantitative research approach. A self-report questionnaire was administered to gather data about the participants' perceptions of web-based assessment for a pedagogical content knowledge course after they took an achievement test as part of the assessment requirements in the teacher training program. However, the study also included qualitative data drawn from the participants by interviewing with them to get a deeper insight into their opinions about the achievement test they were administered on the computer. It can be stated that the study was carried out with a mixed-method research design in which both quantitative and qualitative data were collected (Dörnyei, 2007). Yet, the bulk of data in the study was quantitatively gathered.

3.2. Participants

The participants for this study consisted of 50 pre-service English teachers currently enrolled in *Approaches and Methods* course in an undergraduate English language teaching department (ELT) at a large state university in Ankara. The course is one of the pedagogical content knowledge courses compulsory in completing their training program. 82% of the participants (N=41) were females and 18% (N=9) were males. They ranged in age from 19 to 23 (M=20.64 years old, SD = .85). All the participants had previously undergone an IT training course (*Computer I* and *Computer II*, two 4-credit courses) for general computer literacy and skills. Though participation was voluntary, all of the students opted to answer the survey, yielding a 100% response rate.

3.3. Instrument

The instruments for this study were a web-based assessment questionnaire and an interview with open-ended questions. Based on Davis' (1989) technology acceptance model (TAM) and adapted and validated by Alkis (2010) and Alkis and Özkan (2010), the quantitative self-report questionnaire consisted of two parts. The first part included five questions that characterize the participants such as age, gender, computer literacy and others. The second part

consisted of 37 statements to measure the participants' perceptions about five factors: perceived ease of use, perceived usefulness and intention of web-based assessment as well as anxiety and computer attitude. All the statements were designed to be rated using a five-point Likert scale, and the participants rated the items by choosing the responses among (1) strongly disagree, (2) disagree, (3) neutral, (4) agree, and (5) strongly agree. It contained four "negatively-keyed" statements such as that of the anxiety measures that were reverse coded to ensure consistency. In measuring the internal consistency of the instrument, Cronbach's alpha reliability coefficients of the items ranged between .947 and .952 and Cronbach's coefficient alpha yielded .950 for the whole instrument. These high alpha values indicated good internal consistency of the items in the instrument. For qualitative data, the researcher conducted individual interviews with ten students and posed them some open-ended questions as regards their previous experience, their likes and dislikes about the online exam, their preferences over test modes and any pros and cons of the online exam.

3.4. Data collection

This study was conducted during the 2012-2013 academic year spring semester in an undergraduate English language teaching department (ELT) at a large state university in Ankara. The participants were enrolled in a pedagogical content knowledge course contained in the curriculum. That is, they were taking the *Approaches and Methods* course, which focused on language teaching approaches, methods and techniques through a face to face instructional approach. One module of the course included Communicative Language Teaching and the participants were administered a web-based achievement test as part of the assessment requirements in the English teacher education program. It is beyond the scope of this paper to go into the web-based achievement test administered for formative assessment. As soon as they finished answering the test questions, they completed an online version of the questionnaire in order to express their attitudes and perceptions about the web-based assessment. This was followed by interview sessions that included a total of ten participants because of their convenient accessibility and proximity to the researcher so that they would get the opportunity to express themselves fully.

3.5. Data analyses

Data analysis was conducted to address the research questions of the present study. Data gathered from the questionnaire was fed into the computer and analysis was carried out using SPSS (Statistical Package for the Social Sciences) 20, a comprehensive computer program used to help researchers perform statistical analysis easily and quickly. Descriptive analysis such as frequency and mean were obtained to characterize the collected data. Average scores for the questionnaire items were obtained to provide an overview of the pre-service English teachers' overall perceptions about web-based assessment. Other statistical analysis tests conducted for the study consisted of correlation tests, T-test and One-Way ANOVA. Correlation test is a statistical test which measures the strength of relationship between two variables (Mackey and Gass, 2005; Ravid, 2011; Field, 2009). Two types of correlation tests were used in this study, the Pearson product-moment correlation test (r) and Spearman's rank-order correlation coefficient (r_s). The Pearson product-moment correlation is used for data measured on an interval or ratio scale, while the Spearman's rank-order correlation is employed for nominal and ordinal data (Ravid, 2011).

Spearman's rank-order correlation was computed to investigate whether or not the participants' gender, duration of internet usage and frequency of internet usage and level of computer literacy affect their attitudes towards web-based assessment. The Pearson product-moment correlation was conducted to examine the relationship between the students' perceived usefulness, perceived ease of use, computer attitude, anxiety, and students' intention towards web-based assessment. According to Larson-Hall (2010), Likert-scale items yield interval numbers since they are clearly and evenly distributed along the continuum. Thus, the Pearson product-moment correlation was used for this part of the analysis. In addition, independent samples T-test, a statistical analysis that compares the means of two groups of data (Larson-Hall, 2010; Ravid, 2011; Field, 2009), was conducted to compare the attitudes of male and female students. On the other hand, an analysis of variance (ANOVA) was conducted to compare the perceptions of the participants who prefer web-based assessment, paper-based assessment, and both types of assessment. One-Way

ANOVA was used instead of t-test because there were three options of test mode preferences being compared. All statistical tests conducted for this study were assessed at the 0.05 level of significance.

4. Results and Discussion

This section presents the results of the current study in terms of descriptive and inferential statistics followed by a discussion and analysis of the findings. A short presentation of the participants' opinions is also given at the end of the section. It also compares the findings with the research studies conducted previously.

4.1. Descriptive statistics

The participants for the study were predominantly female (82%). More than half (66%) of them reported having a GPA of 3.00 to 3.49, two (4%) reported having a GPA of 3.50 to 4.00 and the rest had GPAs below 3.00. The mean GPA was found to be 2.26. Nearly half (48%) of the participants use the internet more than eight hours per week, 20% of them use it six to eight hours and the rest use the internet three to six hours per week (16%) and less than three hours per week (16%). Overall, they spend six to eight hours browsing the internet per week. Most of the participants had been using the internet for quite a while, with half (50%) having started five to nine years ago and others (46%) more than 10 years. Only two (4%) participants reported having only four years or less internet experience. The mean rating for computer literacy was 3.44, which is between the "tolerable" (54%) and "good" (36%) ratings. The highest proportion (48%) of the participants prefers having both web-based and paper-based examinations. Only four participants (8%) prefer web-based examinations only and the remaining participants (44%) prefer paper-based examinations only.

The general mean scores for each of the five dimensions used to measure the students' opinions and attitudes were obtained by combining the ratings for the corresponding items. As shown in Table 1, the mean scores were not consistent. To simplify the analysis, a neutral range was set to be between 2.75 and 3.25. This means all ratings within this range were considered to be neutral. Based on this neutralization of 5-point scale, intention and anxiety received neutral ratings (M=2.99; M=3.00, respectively), perceived usefulness received a negative (M=2.53<3) rating, while perceived ease of use (M=3.29>3) and computer attitude (M=3.83>3) received positive ratings. To further assess the participants' ratings, the individual factors were examined. For the intention and perceived ease of use measures, all scores fell within the neutral range. Ratings for the perceived usefulness were consistently negative and below the neutral range, which suggests that students have some concerns regarding the usefulness of web-based assessment to them. One anxiety measure ("I felt anxious about using the web based assessment system") obtained a positive rating, which means most of the students disagree with the statement (reverse coded). Computer attitude measures were consistently positive and above the neutral range, which suggests that the participants generally have a positive perception about the use of computers.

Table 1. Mean scores for the pre-service English teachers' perceptions of web-based assessment

Item and Item Description	Mean	SD	1	2	3	4	5
Factor 1 – Intention							
1. By using the web based assessment system in the exams, I was able to answer the questions more quickly compared to a paper-based exam.	2.92	1.084	5	12	19	10	4
6. Web based assessment system enabled me to take exams easily.	2.96	1.035	7	11	13	15	4
13. Using the web based assessment system to take exams was a good idea.	2.88	1.206	10	7	14	17	2
14. Using the web based assessment system to take exams was a wise idea.	3.04	1.261	9	7	11	19	4
15. I liked the idea of using the web based assessment system.	3.08	1.242	8	6	16	14	4
16. Using the web based assessment system was pleasant.	3.08	1.209	7	8	14	16	5

17. The web based assessment system provided an attractive exam environment.	3.02	1.169	6	10	16	13	5
18. I found using the web based assessment system enjoyable.	3.22	1.329	10	1	15	16	8
19. In general, I was positive toward web based assessment system.	2.90	1.249	9	10	12	15	4
20. I intend to take courses that use the web based assessment in the future.	2.84	1.251	9	11	14	11	5
27. It was comfortable to work with the web based assessment system.	3.00	1.049	4	12	17	14	3
Factor 2 - Perceived usefulness							
2. Using web based assessment system improved my performance in the exam.	2.64	1.083	9	13	16	11	1
3. Using web based assessment system increased my productivity in the exam	2.48	1.073	11	14	16	8	1
5. Using web based assessment system enhanced my effectiveness in the course.	2.50	1.035	9	16	18	5	2
21. If I am offered, I intend to take all exams with the web based assessment system.	2.54	1.181	13	10	16	9	2
22. I wish I used the web based assessment system for other courses as well.	2.50	1.281	15	10	14	7	4
Factor 3 - Perceived ease of use							
4. I found the web based assessment system useful.	3.10	1.297	8	8	12	15	7
7. I think the web based assessment system was useful in Approaches to ELT II course.	3.00	1.195	8	8	13	18	3
8. Learning to use the web based assessment system was hard for me.	2.82	1.335	10	12	12	9	7
9. My interaction with the web based system was clear and understandable.	3.80	1.010	2	2	13	20	13
10. My interaction with the web based assessment system did not require a lot of mental effort.	3.08	1.140	4	13	13	15	5
11. I found the web based assessment system easy to use.	3.96	.902	1	3	6	27	13
12. It was easy to navigate through the web based assessment system.	3.52	1.014	2	5	16	19	8
33. I felt comfortable when using the web based assessment system on my own.	3.30	1.199	6	5	14	18	7
34. I was able to use the web based assessment system even if there was no one around show me how to use it.	3.30	1.249	6	7	11	18	8
35. I was confident that I had adequate ability to operate the web based assessment system.	3.34	1.099	5	4	15	21	5
36. I was confident that I could use the web based assessment system even if I had no prior experience on similar systems.	3.18	1.223	7	6	14	17	6
37. I could use the web based assessment system if an assistant showed me how to do it first.	3.12	1.096	2	8	22	8	10
Factor 4 – Anxiety							
23. The web based assessment system was somewhat intimidating to me.	2.76	1.079	3	8	20	12	7
24. I hesitated to use the web based assessment system for fear of making mistakes that I couldn't correct.	3.08	1.259	8	12	11	14	5
25. I felt anxious about using the web based assessment system.	3.26	1.258	9	16	8	13	4
26. Working with the web based assessment system made me	2.90	1.233	6	11	11	16	6

nervous.							
Factor 5 – Computer attitude							
28. Computers are bringing us into a bright new era.	3.62	.987	1	6	13	21	9
29. The use of computers is enhancing our standard of living.	3.92	.829	1	2	7	30	10
30. There are unlimited possibilities of computer applications that have not even been thought of yet.	3.92	.853		2	14	20	14
31. Computers are responsible for many of the good things we enjoy.	3.88	1.154	3	2	12	14	19
32. Working with computers is an enjoyable experience.	3.82	1.137	4	1	10	20	15

4.2 *Inferential statistics*

Spearman correlation test was conducted to examine possible correlations of the participants' demographic characteristics (Table 2). The results revealed that there was a moderate positive relationship between gender and internet use (r=.320, n=50, p=.023) as well as a strong positive relationship between gender and computer literacy (r=.419, n=50, p=.002). Computer literacy was also found to be positively and significantly correlated with frequency of internet use (r=.332, n = 50, p=.018) and the number of years the participants had been using the internet, r=.298, n=50, p=.035.

Table 2. Correlation test between the pre-service English teachers' characteristics

		Gender	GPA	Internet use	Start	Computer literacy	Exam preference
Gender	Correlation Coefficient	1					
	Sig. (2-tailed)	.					
GPA	Correlation Coefficient	0.087	1				
	Sig. (2-tailed)	0.547	.				
Internet use	Correlation Coefficient	.320*	-0.062	1			
	Sig. (2-tailed)	0.023	0.667	.			
Start	Correlation Coefficient	-0.202	0.016	-0.106	1		
	Sig. (2-tailed)	0.159	0.91	0.463	.		
Computer literacy	Correlation Coefficient	.419**	0.026	.332*	-.298*	1	
	Sig. (2-tailed)	0.002	0.856	0.018	0.035	.	
Exam preference	Correlation Coefficient	0.193	-0.177	0.239	-0.024	0.097	1
	Sig. (2-tailed)	0.179	0.219	0.095	0.867	0.505	.

**. Correlation is significant at the 0.01 level (2-tailed)
*. Correlation is significant at the 0.05 level (2-tailed).

As shown in Table 3, for the participants' characteristics and internet usage patterns, significant correlations were found between internet use and perceived ease of use, r=.401, n=50, p=.004, and computer attitude, r=.348, n=50, p=.013. The results also showed a moderate negative relationship between computer literacy and anxiety, which suggests that more proficient internet users are less anxious about using web-based assessments than those who are not so familiar with the internet, r=-.381, n=50, p=.006. The participants' GPA did not seem to be related to any of the other dimensions.

Table 3. Correlation test between the pre-service English teachers' characteristics and internet usage patterns

		Intention	Perceived usefulness	Perceived ease of use	Anxiety	Computer attitude
Gender	Correlation Coefficient	0.092	-0.002	0.105	-0.203	0.08
	Sig. (2-tailed)	0.525	0.99	0.469	0.158	0.582
GPA	Correlation Coefficient	-0.13	-0.2	-0.119	-0.277	-0.027
	Sig. (2-tailed)	0.368	0.165	0.408	0.052	0.854
Internet use	Correlation Coefficient	0.190	0.108	.401**	-0.132	.348*
	Sig. (2-tailed)	0.186	0.455	0.004	0.361	0.013
Start	Correlation Coefficient	0.033	0.066	-0.078	0.06	-0.122
	Sig. (2-tailed)	0.820	0.650	0.592	0.681	0.397
Computer literacy	Correlation Coefficient	-0.02	-0.065	0.000	-.381**	-0.127
	Sig. (2-tailed)	0.89	0.652	0.996	0.006	0.379

**. Correlation is significant at the 0.01 level (2-tailed)
*. Correlation is significant at the 0.05 level (2-tailed).

Table 4 shows the correlation test results of the students' perceived usefulness, perceived ease of use, computer attitude, anxiety, and students' intention towards web-based assessment. Significant correlation was found between intention and three dimensions: perceived usefulness, *r*=-.921, n=50, p=.000, perceived ease of use, *r*=-.796, n=50, p=.000, and computer attitude, *r*=-.555, n=50, p=.000. Perceived usefulness was also positively correlated with perceived ease of use, r=-.741, n=50, p=.000, and computer attitude, *r*=-.479, n=50, p=.000, while perceived ease of use was found to be negatively associated with anxiety *r*=-.-359, n=50, p=.010, and positively associated with computer attitude, *r*=-.673, n=50, p=.000.

Table 4. Correlation test of the pre-service English teachers' perceptions by factors

		Intention	Perceived usefulness	Perceived ease of use	Anxiety	Computer attitude
intention	Pearson Correlation	1				
	Sig. (2-tailed)					
Perceived usefulness	Pearson Correlation	.921**	1			
	Sig. (2-tailed)	0.000				
Perceived ease of use	Pearson Correlation	.796**	.741**	1		
	Sig. (2-tailed)	0.000	0.000			
Anxiety	Pearson Correlation	-0.187	-0.111	-.359*	1	
	Sig. (2-tailed)	0.195	0.441	0.010		
Computer attitude	Pearson Correlation	.555**	.479**	.673**	-0.223	1

Sig. (2-tailed)	0.000	0.000	0.000	0.120

**. Correlation is significant at the 0.01 level (2-tailed).
*. Correlation is significant at the 0.05 level (2-tailed).

Male and female participants' perceptions were compared using an independent-samples t-test. Mean scores of males and females suggest differences across the five dimensions tested. Table 5 shows that female participants have lower ratings in the four dimensions (intention, usefulness, ease of use, and computer attitude) but higher rating in anxiety measures than the male participants. However, the t-test result shows that the *p*-value for the differences between females and males is more than 0.05 in all cases, which means that there is not any statistically significant difference in mean scores of males and females.

Table 5. Comparison of the pre-service English teachers' perceptions by gender

	Gender	N	Mean	Std. Deviation	t	Sig. (2-tailed)
Intention	Female	41	2.93	.997		.397
	Male	9	3.26	1.183	-.854	
Perceived usefulness	Female	41	2.52	.944	-.152	.880
	Male	9	2.58	1.227		
Perceived ease of use	Female	41	3.27	.669	-1.138	.261
	Male	9	3.54	.609		
Anxiety	Female	41	3.10	.970	1.320	.193
	Male	9	2.66	.652		
Computer attitude	Female	41	3.79	.835	-.876	.385
	Male	9	4.04	.623		

*p<0.05

Even though 48% of the participants reported that they preferred taking both web-based and paper-based tests according to the results of descriptive statistics, only 8% of them stated they preferred web-based examinations only. The remaining participants (44%) reported that they preferred paper-based examinations only. In order to further explore this issue employing inferential statistics, a one-way ANOVA was run to identify differences in perceptions among three groups of the participants who prefer web-based, paper-based or a combination of the two (Table 6). The *p*-values for the intention, perceived usefulness and perceived ease of use are less than the α level set for the study, which means that the mean scores of the participants who prefer web-based tests are significantly different from each other. Overall, preferences for web-based assessment differed significantly across three dimensions of the measure: intention, $F(2,47) = 17.574$, $p = .000$; perceived usefulness, $F(2, 47) = 11.069$, $p = .000$; and perceived ease of use, $F(2,47) = 10.504$, $p = .000$. However, for anxiety and computer attitude, the *p*-values obtained were greater than the α level, $F(2,47) = 1.071$, $p = .351$ and $F(2,47) = 2.158$, $p = .127$.

Table 6. Comparison of participants' perceptions based on preferred type of assessment

		Sum of Squares	df	Mean Square	F	Sig.
Intention	Between Groups	22.131	2	11.065	17.574	.000
	Within Groups	29.594	47	.630		
	Total	51.725	49			
Perceived usefulness	Between	22.138	2	11.069	20.329	.000

	Groups					
	Within Groups	25.591	47	.544		
	Total	47.729	49			
Perceived ease of use	Between Groups	6.615	2	3.307	10.504	.000
	Within Groups	14.799	47	.315		
	Total	21.414	49			
Anxiety	Between Groups	1.853	2	.927	1.071	.351
	Within Groups	40.678	47	.865		
	Total	42.531	49			
Computer attitude	Between Groups	2.647	2	1.323	2.158	.127
	Within Groups	28.822	47	.613		
	Total	31.469	49			

*p<0.05; **p<0.001

4.2. Results of qualitative data

The quantitative data reported in the above sections were based on organized statistics from a five-point Likert scale. By means of convenient sampling technique, the researcher also conducted interviews with some participants in Turkish and asked them open-ended questions in order to give them the opportunity to express themselves fully. The following spontaneous comments they made might illustrate a variety of opinions held by the participants about web-based assessment within their course.

- Student Teacher 1: *"... It was fine to take the exam online. I was able to get my timing right in the exam. I was able to answer the questions more quickly. But I prefer taking the traditional paper-and-pencil test, an old habit from the past. Holding the paper and underlining the important points increase my motivation."*
- Student Teacher 2: *"This isn't the first time I have taken an online exam. I wasn't anxious about it because I am accustomed to such types of tests. I was able to answer the questions more quickly, I didn't spend much time writing the answers on the answer sheet… The only thing that I can criticize in the web-based exam is that there is no human factor in scoring the test."*
- Student Teacher 3: *"I am not the kind of person who spends lots of time using the computer. So I prefer the traditional paper-based exam. It is necessary for me to underline the important points. I cannot do this on the computer. (smiling face)"*
- Student Teacher 4: *"In time paper-based exams may be replaced by computer-based exams. Because I learned my score immediately after I took the exam on the web. I saw and learned my incorrect answers and those questions I didn't answer. This is very important for me. We used to wait for a very long time to learn our exam scores. In the past, we couldn't learn anything about the questions we answered incorrectly and the questions we skipped. It was likely that we made the same mistakes again. It is more different now, pedagogical."*
- Student Teacher 5: *"Indeed, I was very stressed before I took the exam. I didn't think I would be able to do without paper and pencil. But the exam was very nice, it didn't turn out to be difficult at al. It is definitely more advantageous to take the test on the web. There is nothing to fear."*

It is beyond the scope of the present study to code their comments into certain patterns and trends, and the opinions must not be considered as totally typical of the whole sample in the study. It is just that these quotations serve to give a general impression of their opinions and perceptions about the test they took online.

At a time when many universities are trying to blend their instructional activities with e-learning and e-assessment (Demiray, 2011), the present study yielded some significant findings regarding the pre-service English

teachers' perceptions of web-based assessment within their methods and approaches course. Below is a discussion of the findings structured along with the research questions formulated previously.

1. What are the pre-service English teachers' general perceptions of web-based testing for their course?

The results of the present study demonstrated that the pre-service English teachers have generally positive computer attitude and positive perception towards ease of use of web-based testing for their *Approaches and Methods* course. However, their intention scores fall within the neutral range, which implies some sort of indifference towards getting this type of assessment. Even though they are not against the use of web-based assessment in general, this might be an indicator that they may not be so interested in using it in the future. They might view it as a mandatory part of their course rather than an opportunity to use technology and enhance their technical skills. This idea is further confirmed by the perceived usefulness ratings, which is significantly lower than the other mean scores. This implies that the students did not fully appreciate the use of web-based assessment for their *Approaches and Methods* course. The participants may not consider the medium to be appropriate for their course.

2. Do the pre-service English teachers prefer web-based assessments over paper-based assessments?

The results revealed that very few of the students prefer computer-based tests over paper-based tests. Almost half (48%) indicated preference for a combination of the two types of examination. This could imply that the students are not convinced that using only web-based assessment is appropriate for their course, but they are also willing to use this type of exams in certain cases. This finding is also supported by the quotations from a variety of comments they made during the interview sessions.

3. Do gender, duration of computer use and frequency of internet usage and level of computer literacy affect the pre-service English teachers' perceptions of web-based assessment?

The results of the study also indicated that gender is significantly linked with internet usage and computer literacy. As confirmed by the average scores, male participants spend more time using the internet and they generally have higher levels of computer literacy. However, there was not any statistically significant difference between female and male participants' overall opinions and attitudes. This supports the findings of Akdemir and Oğuz (2008) and Dermo (2009) that attitudes of male and female students towards the use of web-based assessment are comparable. The study also found that duration and frequency of internet usage and level of computer literacy are related to the undergraduate students' perceived ease of use and computer attitude. This suggests that more time spent using the internet could increase ease of use and computer literacy. The results also revealed that there was a negative association between computer literacy and anxiety, which suggests that more proficient internet users are less anxious about using web-based assessments than those who are not so familiar with the internet.

In contrast to Wong *et al*.'s (2001) finding that test scores is linked with frequency of use, the current study did not find any significant relationship between the students' GPA and frequency of internet usage or any other dimension. In addition, there was not a statistically significant relationship between computer literacy and students' GPA, This could be attributed to the fact that all the participants had previously undergone an IT training course for computer literacy, so their computer proficiency level differences might not be so significant. However, regarding computer- vs. paper-based test scores in general, numerous authors such as Akdemir and Oğuz (2008) and Chapelle and Douglas (2006) stress that computer experience, familiarity or competency could affect the scores and confidence in undergoing computer-based testing.

4. Does the pre-service English teachers' intention towards web-based assessment relate to (a) perceived usefulness, (b) perceived ease of use, (c) computer attitude, and (d) anxiety?

The findings of the study revealed significant associations between perceived usefulness, perceived ease of use, computer attitude, anxiety, and students' behavioral intention towards web-based assessment. This confirms Wong *et al*.'s (2001) study. This means that students who view web-based testing as useful and easy to use testing medium tend to have more positive attitudes towards the use of the internet and intention to use the internet. On the other hand, there was not any statistically significant difference between male and female participants' anxiety levels. This is inconsistent with the findings of Davidson-Shiver *et al*. (2008) that female participants tend to be more anxious than their counterparts. In fact, the results revealed that female participants had lower anxiety ratings than male participants. This could be attributed to the fact that unlike Davidson-Shiver *et al*.'s (2008) sample, the participants for this study had taken mandatory computer courses, which might have increased their competence and confidence in using computers.

5. Conclusion

This study examined the pre-service English teachers' perceptions of web-based assessment for a course they took in an ELT department at a large state university in Ankara. The course was one of the pedagogical content knowledge courses required in completing their training program. Fifty student teachers who were enrolled in *Approaches and Methods* course and who had formerly taken a mandatory IT training course were selected as the sample of the study. The study primarily made use of quantitative research design. Students' opinions and perceptions were gathered using a self-administered online questionnaire. Descriptive statistics, correlation tests, T-test and ANOVA were employed to analyze the data gathered form a self-report questionnaire. The results showed that although the students did not seem to fully appreciate the use of web-based assessment and showed lack of interest to use this form of assessment in their future classes, they showed a positive computer attitude and positive perception towards ease of use of web-based testing for their course. Currently, they are reluctant to shift to a fully web-based form of assessment, but more students prefer having web-based assessment in combination with paper-based assessment than having only paper-based assessment. This is also supported by the comments they made during interviews. Factors such as frequency of internet usage and level of computer literacy were also found to have significant impact on the students' attitudes towards web-based assessment.

Given the importance of ICT in education and pre-service English teachers' perceptual and behavioral intentions of web-based assessment towards technology acceptance, it is fair to suggest that ELT programs should give priority to e-learning rather than e-assessment endeavors in LMS. On logical grounds, one way to do is blending a face to face instructional approach with online learning activities. Due to the time and resource constraints, the participants of the study who were surveyed only represent students taking *Approaches and Methods* course in an ELT department at a large state university. The future studies could address this issue by targeting a more diverse group of student teachers of English.

References

Alkis, N. (2010). *Identifying factors that affect students' acceptance of web-based assessment tools within the context of higher education*. (Unpublished master's thesis) METU, Ankara.

Alkis, N., & Özkan, S. (2010). Work in progress - a modified technology acceptance model for e-assessment: Intentions of engineering students to use web-based assessment tools. Paper presented at FIE 2010 Conference, October 27 - 30, 2010, Washington, DC, USA. Retrieved from http://www.fie-conference.org/fie2010/papers/1500.pdf

Akdemir, A. and Oğuz, A. (2008) Computer-based testing: An alternative for the assessment of Turkish undergraduate students. *Computers & Education, 51*, 1198–1204. doi:10.1016/j.compedu.2007.11.007

Bonham, S. W., Titus, A., Beichner, R. J., & Martin, L. (2000) Education research using web-based assessment systems. *Journal of Research on Computing in Education, 33*(1), 28-44. Retrieved from http://connection.ebscohost.com/c/articles/3510096/education-research-using-web-based-assessment-systems.

Bull, J. (1999). Computer assisted assessment: Impact on higher education institutions. *Educational Technology & Society, 2*(3), 123-126.

Bull, J., & Danson, M. (2004). Computer-assisted assessment (CAA). Generic Centre Assessment Series 14. Retrieved from http://www.heacademy. ac.uk/assets/documents/assessment/LTSNassess14_computer_assisted_assessment.pdf

Bull, J., & McKenna, C. (2004). *Blueprint for computer-assisted assessment*. London: RoutledgeFalmer.

Chapelle, C., & Douglas, D. (2006) Assessing language through computer technology. Cambridge: Cambridge University Press.

Conole, G., & Warburton, B. (2005). A review of computer assisted assessment. *ALT-J, Journal of Research in Learning Technology, 13*(1), 17-31.

Costa, D. S. J., Mullan, B. A., Kothe, E. J., & Butow, P. (2010). A web-based formative assessment tool for Masters students: A pilot study. *Computers & Education, 54*, 1248–1253.

Davidson-Shiver, G. V., Adkinson, J. E., & Jackson, M. K. (2008). Using technology to teach technology: Effects on student performance and opinions. *International Journal of Instructional Media, 35*(4), 401-412.

Davis, F. D. (1989). Perceived usefulness, perceived ease of use, and user acceptance of information technology. *MIS Quarterly, 13*(3), 319-340.

Davis, F. D., Bagozzi, R. P., & Warshaw, P. R. (1989). User acceptance of computer technology: A comparison of two theoretical models. *Management Science, 35*(8), 1989, 982-1003.

Demiray, U. (2011). Distance education and eLearning practices: In Turkey and Eastern countries. *eLearning Papers, 24*, 1-24. Retrieved from http://www.elearningeuropa.info/files/media/media25539.pdf

Dermo, J. (2009). e-Assessment and the student learning experience: A survey of student perceptions of e-assessment. *British Journal of Educational Technology, 40*(2), 203–214. doi:10.1111/j.1467-8535.2008.00915.x

Dörnyei, Z. (2007). *Research methods in applied linguistics: Quantitative, qualitative, and mixed methodologies*. Oxford: Oxford University Press.

Field, A. (2009). *Discovering statistics for SPSS* (3rd ed.). Los Angeles, CA: SAGE Publications.

Jamil, M., Topping, K. J., & Tariq, R. H. (2012). Perceptions of university students regarding computer assisted assessment. *The Turkish Online Journal of Educational Technology, 11*(3), 267-277.

JISC. (2007.) *Effective Practice with e-assessment: An overview of technologies, policies and practice in further and higher education*. Retrieved from http://www.jisc.ac.uk/media/documents/themes/elearning/effpraceassess.pdf.

Larson-Hall, J. (2010). *A guide to doing statistics in second language research using SPSS*. New York, NY: Routledge.

Mackey, A., & Gass, S. M. (2005). *Second language research: Methodology and design*. Mahwah, NJ: Lawrence Erlbaum Associates.

Myrick, J. (2010). *Moodle 1.9 testing and assessment: Develop and evaluate quizzes and tests using Moodle modules*. Birmingham: Packt Publishing.

Ravid, R. (2011). *Practical statistics for educators* (4th ed.). Plymouth, UK: Rowman & Littlefield.

Saricoban, A. (2013). Prospective and regular ELT teachers' digital empowerment and self-efficacy. *Porta Linguarum*, *20*, 77-87.

Wong, C. K., Wong, W., & Yeung, C. H. (2001). Student behaviour and performance in using a web-based assessment system. *Innovations in Education and Teaching International, 38*(4), 339-346. doi:10.1080/14703290110074542