

PROMOTING TEACHERS' POSITIVE ATTITUDE TOWARDS WEB USE: A STUDY IN WEB SITE DEVELOPMENT

Yavuz AKPINAR, Yusuf BAYRAMOĞLU
Boğaziçi Üniversitesi, Eğitim Fakültesi
Bebek, İstanbul
akpinar@boun.edu.tr

ABSTRACT

The purpose of the study was to examine effects of a compact training for developing web sites on teachers' web attitude, as composed of: web self efficacy, perceived web enjoyment, perceived web usefulness and behavioral intention to use the web. To measure the related constructs, the Web Attitude Scale was adapted into Turkish and tested with a sample of 156 teachers. Then, a web site development training based upon behavioral modeling method of instruction was conducted with sixteen teachers. The training created a positive and significant difference on the participants' web attitude, web self efficacy and perceived web usefulness scores. Although the post training scores of perceived web enjoyment and behavioral intention to use the web were higher than the pre training scores, the differences were not significant. The results are encouraging and suggest that teachers should involve more in design and development of web based materials to help students to learn.

Keywords: web attitude, self efficacy, web usefulness, teacher development, web enjoyment, behavioral intention

INTRODUCTION

Technology based teaching and learning materials became more common in educational settings. To provide an information source for teachers, administrators, students and parents, different portals and web sites have been developed worldwide. In Turkey, For example, Education News Portal (Eğitim Haber Portalı) collects and serves updated news about education from all over local and the World Media with the help of a news agency. In another portal (Öğretmenler portalı), teachers are able to find information about the new curriculum, programs, activities, and sample annual plans for classes for different majors. A third portal (Bilgiye Erişim Portalı) provides facilities for administration. It includes modules for teachers, administrators and students. Teachers will be able to share information and resources with each other. In the administration part, students' grades are now announced via the Internet. A more recent site (Skool) provides online content for science and mathematics. While having technological resources is important, another critical issue is whether the teachers, students, and administrators are ready to use the available technology. In a study carried out in thirty-four Curriculum Laboratory Schools with 1705 teachers (Tüy, 2003), it was reported that the number of teachers using educational technology devices like CD-Rom, DVD and data-show was very small although schools had the required equipment. None of the teachers reported that they used the Internet in their lessons: Teachers emphasized that they needed specialists who could support them and provide required information to use educational technology. Later, Demiralp and Usluel (2005) presented similar results: Majority of the participant teachers confirmed that they often preferred traditional methods instead of integrating information and communication technology in the education process. The rate of the teachers who had never participated in an online project with their students was 80%. In another study (Deniz, 2005), teachers and school administrators' use of computer for professional purposes was stated as low. Further, Kabadayı (2006) reported that teachers mostly tended to use traditional teaching devices rather than contemporary devices: Although they did not perceive the use of technological devices as a waste of time and believed in its positive effect on learning, they were not motivated enough to overcome the difficulties of manipulating technological devices. There seems to be different variables affecting technology adoptions and use which needs to be considered in getting individuals to benefit from new technologies.

Attitude towards computers and the internet

Recently, attitude towards computers and the Internet has been the subject of many studies, within different theoretical frameworks and methods. Also, there have been a substantial number of studies in Turkey about teachers' attitudes towards technology use (e.g. Akkoyunlu, 1996; Altun, 2003; Asan, 2002; Bayhan, Olgun & Yelland, 2002; Deniz, 2005; Gomleksiz, 2004); however most of those studies examined the interaction between attitude toward technology and teacher/prospective teacher characteristics. For example, Altun (2003) studied the interaction between prospective teachers' attitude towards computers and their cognitive styles, the study concluded that cognitive styles could not be considered as an effective contributor to participants' attitudes toward computers. Another study in Turkey (Deniz, 2005) showed that male teacher have more favorable attitudes than female teachers, and less experienced teachers have more favorable computer attitudes than the ones with more teaching experience. Also, there is a meaningful relation between teachers' knowledge about technology and their attitude towards it; the prospective teachers with more information about technologies have

more positive attitude towards the use of technologies in their profession (Akkoyunlu, 1996). Further, the studies by Asan (2002) and Gomleksiz (2004) found that teachers have positive attitudes towards the use of technology, though they cannot use technologies at the desired level (Gomleksiz, 2004).

The most influential study in technology acceptance was conducted by Davis (1989). It attempted to predict and to explain the information system use and developed the Technology Acceptance Model (TAM) in which two theoretical constructs, and perceived usefulness (PU) and perceived ease of use (PEOU), were examined as fundamental determinants of system use. The study showed that usefulness was significantly more strongly linked to usage than ease of use was. Users were ready to deal with difficulty in use if they believed in the benefits of the system. Regression analyses supported that the ease of use might be an antecedent to usefulness rather than a direct determinant of the system use. Later, the TAM was extended and used by adding new variables. For example, Yanga and Yoob (2004) reported that cognitive dimension of attitude and PU had a direct relation with information system use; attitude explained more than twice as many variances of information system use as did PU. Moreover, several researches extended the TAM model by including the concept of cognitive absorption, a state of deep involvement with the system. Saade and Bahli (2005) revealed that cognitive absorption is an important antecedent to PU but less important to PEOU. As advocated by prior research (Davis, 1989; Flavian, Guinaliu & Gurrea, 2005; Venkatesh et al., 2003; Wixom & Todd, 2005), the analysis verified that there was a positive effect of PEOU on PU. Roca, Chiu and Martinez (2006) included cognitive absorption as a determinant of the PU, and found that the influence of perceived quality of information, service and system on confirmation, and satisfaction was strong. When the Internet is considered, information quality emerged as an important factor which especially influenced usefulness. In addition, predictor variables of the PU and PEOU were also examined (Lederer, Maupin, Sena & Zhuang, 2000; Lin & Lu, 2000; Thong, Hong & Tam, 2002; Wixom & Todd, 2005). Information quality was found as to be the predictor for usefulness and for ease of use; the highest predictive power was the ease of understanding. The fact that there was a stronger effect of usefulness than ease of use on web site use was consistent with previous research. Thus, these studies demonstrate that the effects of external variables appeared to depend on the nature of the information system used and external variable itself. The findings consistent across technologies also verified that PU was a more powerful predictor of usage than PEOU.

Self-efficacy and enjoyment in information system use

Self efficacy was another widely studied component in information system use research. David, Song, Hayes and Fredin (2007) examined the relationships among goal difficulty, goal success and self efficacy in success in Internet use, and reported that the immediate effect of self-efficacy came from the success of one cycle leading to a decrease in perceived goal difficulty on the next cycle. The underlying reason was that each cycle the user finished with success increased the self-efficacy of the user, thus it improved performance in subsequent cycles and mediated further success. Furthermore, Wilfong's (2006) empirical analyses indicated that computer self-efficacy beliefs, not computer experience or use, had the largest significant relationship with both computer anxiety and anger. In a similar study, Mcilroy, Sadler and Boojawon (2007) stated that students who reported either high computer phobia or low computer self-efficacy were less likely to maximize their use of university computer facilities. Hence, it is vital for individuals to have a sense of self-efficacy in new systems to be used.

Further, the impact of enjoyment on usage intentions was examined by Davis, Bagozzi and Warshaw (1992). The degree of enjoyment experienced in using computers emerged as the second variable after usefulness. Enjoyment played a more important role on affecting intentions when the PU of computer programs was high. More recently, Teo, Lim and Lai (1999) investigated the effect of intrinsic (perceived enjoyment) and extrinsic (PU) motivation for the use of Internet: The direct effects of PU and perceived enjoyment were at least three times greater than the direct effects of PEOU on daily Internet usage. Moon and Kim (2001) added playfulness as a new factor that represented intrinsic motivation of the user and confirmed that PEOU and PU were determinant variables of attitude. Motivation variables of enjoyment, self-efficacy and learning goal orientation were added to the TAM model in order to predict the use of web-based information systems by Yi and Hwang (2003). All these studies showed that enjoyment, learning goal orientation, and application-specific self-efficacy positively influenced the decision to use Web-based technology and subsequent actual use.

Self efficacy in technology use model

The results of many studies confirmed that PEOU emerged as an antecedent to PU rather than a parallel determinant of system use (Davis, 1989; Lederer, Maupin, Sena & Zhuang, 2000; Lin & Lu, 2000; Moon & Kim, 2001; Saade & Bahli, 2005; Roca, Chiu & Martinez, 2006; Burton-Jones & Hubona, 2006). Moreover, the positive relation between self efficacy and the use of computers or internet was confirmed in many studies, and self efficacy was accepted as a determinant of information system use (Bandura, 1997; Compeau & Higgins, 1995a; Hua, Clark & Ma, 2003; Mcilroy, Sadler & Boojawon, 2007; Wilfong, 2006; Yi & Hwang, 2003).

Accordingly, Liaw added self efficacy to his model and defined self efficacy in terms of web as “the confidence to use or learn about the Internet/WWW” (Liaw, 2002a, p. 139). Liaw’s Technology Use Model (TUM), included the TAM, the social cognitive theory, individual attitudes, motivation and self-efficacy, and examined the effect of behavioral self efficacy on perceived usefulness, perceived enjoyment and behavioral intention with TUM. He then developed the Web Attitude Scale (WAS) in order to test this model. It consisted of sixteen items, four items for each construct, web self-efficacy, enjoyment, usefulness and intention to use the web. When the model was tested with a large sample, Web self-efficacy, web enjoyment and web usefulness turned out to have significantly positive effects on behavioral intention to use the Web. Web usefulness was found to be the most, and web enjoyment the least, important determinant of behavioral intention to use the web. In a second study, Liaw (2002b) showed that there was a significantly positive correlation between students’ computer attitudes and Web attitudes. It implied that computer and Web attitudes could provide concurrent validity to each other. Besides; the best three predictors for the Computer Attitudes Survey were experience with word processors, experience in using computers, and experience in using the Internet/WWW. Students’ experience in word processors and experience in using the Internet/WWW were predictors for both computer attitudes and Web attitudes. These results supported that the Computer and Web Attitudes Survey had high criterion validity. The results also indicated that when students had more years in computer-related experience; they had more positive perceptions of computer and Web technologies.

Influence of training and intervention on self efficacy

Different processes may lead to attitude change in different circumstances. Some of these processes require industrious and effortful information processing activity whereas others proceed with relatively little mental effort. Contemporary research indicates that distraction can enhance persuasion if the arguments are weak because the distraction can disrupt the normal counter arguing that would take place and expertise can be bad for persuasion when it leads to enhanced thinking about weak arguments (Petty & Wegener, 1998; p. 379). Conditions that foster people’s motivation and ability to engage in issue-relevant cognitive activity at the time of message exposure are associated with increased persuasion (Elms, 1966). Further, comparison of attitude change scores in a short time period and terminal source credibility ratings by message condition indicated that both the literal and figurative versions produced attitude change (McCroskey & Combs, 1969). As a result, changing self-perception and self-efficacy of an individual about a particular behavior or phenomena will greatly help the individual to change attitude towards that behavior or phenomena (Bohner & Wanke, 2002; Bowers, & Michael, 1966; Rosenberg, 1967; Sherif & Hovland, 1961). Hence, attitude change is about changing one’s way of evaluating the relevant attitude object or phenomena. Once instructional activities are successful at changing one’s way of evaluating the relevant attitude object or phenomena, attitude change may become possible. However, this research is aware that, acceptance of web technologies through interacting with those technologies should be reinforced by continuous activities and assistance.

Influence of training and intervention on self efficacy was studied in details (Chou, 2001; Hua, Clark & Ma, 2003; Karavidas, Lim & Katsikas, 2005; Torkzadeh, Pflughoeft & Hall, 1999; Torkzadeh, Chang & Demirhan, 2006; Wang & Newlin, 2002). Torkzadeh and Dyke (2002) focused on the relationship between training and computer user attitude and Internet self-efficacy. They provided supportive evidence that training significantly improved Internet self-efficacy. Torkzadeh, Chang and Demirhan (2006) reported that the computer training significantly influenced computer and Internet self-efficacy development. Besides, user attitude and computer anxiety significantly influenced computer and Internet self-efficacy development. The respondents with ‘favorable’ attitudes towards computers improved their self-efficacy significantly after the training more than the respondents with ‘unfavorable’ attitudes. In addition, the respondents with ‘low’ computer anxiety improved their self-efficacy significantly more than the respondents with ‘high’ computer anxiety. The interaction effect between attitude and anxiety was significant for computer self-efficacy scores but not for Internet self-efficacy scores.

The effects of training method and computer anxiety on computer self-efficacy and learning performance were also previously examined (Chou & Wang, 2000; Chou, 2001). Two types of training were used in the studies. One method was instruction based training: teachers followed a deductive way and lecture. Another method was the behavior modeling: involved a visual observation of the behaviors of a model performing a task. The studies confirmed that behavior-modeling was superior to the instruction-based approaches on learning performance and self-efficacy: Learning occurred by imitating and extending the model’s behavior in practice. Further, many studies revealed that training influenced computer self-efficacy positively (e.g. Torkzadeh, Pflughoeft & Hall, 1999). Karavidas, Lim and Katsikas (2005) examined relationship among training, self efficacy, anxiety and computer use by retired older adult users. They found that as older users learnt more about computers, self-efficacy became higher and this lowered computer anxiety: The implicit benefits of using computers such as, being more independent, maintaining a social network of friends and families, and staying informed about

health concerns affected older adults' life satisfaction. Additionally, Hua, Clark and Ma (2003) used the TAM and included computer self-efficacy and subjective norm: Computer self-efficacy showed a direct positive effect on user acceptance and it was an important determinant of PEOU. With user experience, the influence of computer self-efficacy on individuals' acceptance decreased. PEOU had limited direct effect on user acceptance. Perceived job relevance was related with PU: If a user considered the technology as relevant to his/her job, it was accepted as useful. Although the effect of subjective norm on acceptance before the training intervention was significant, after the training, its importance was diminished as individuals became experienced in using the technology. In light of these findings, it may be concluded that during the initial acceptance of new technology, colleagues' opinions are worth considering and this should be supported by clear training to increase self efficacy and to develop positive attitude toward technology.

Research questions

The literature highlighted that usefulness, enjoyment, self efficacy and behavioral intention and in general attitude influenced the use of information systems. Altering those variables for a target group of users, e.g. teachers, may help them use and benefit from information system facilities. If self efficacy, enjoyment, usefulness and behavioral intentions of participants are taken into account when developing training plans for teachers, they may be more likely to have a positive attitude. This may, in turn, increase their use of it, particularly for educational purposes. In this study, the influence of a short modular training on teachers' attitude towards the Internet, particularly, web usefulness, web enjoyment, self efficacy in Internet use, and behavioral intention to use the Internet are examined. The following questions are studied:

1. Is there any significant difference in teachers' attitudes toward the Internet/WWW before and after a short training program in terms of self-efficacy, enjoyment, usefulness, and behavioral intention?
2. To what extend does behavior modeling type of training influence teachers' attitude toward the Internet/WWW?

METHODOLOGY

To examine the effect of training on teachers' attitude towards the web; A behavior modeling type of training was developed. It aimed to teach how to create a web site by using Mysite, a free service of the MyNet portal. In order to measure teachers' attitude before and after the training, the Turkish adaptation of the Web Attitude Scale was used. Each sub scale (web self-efficacy, enjoyment, usefulness and intention to use the web) were examined separately in terms of the effect of the training. To measure web self-efficacy, web enjoyment, perceptions of web usefulness, behavioral intention to use the web and attitude towards the web, the WAS (Liaw, 2002a) was first adapted into Turkish in a pilot study with 156 teachers, and then used for collecting data before and after the training. To the training, sixteen teachers (9 female and 7 male) from two Istanbul high schools participated. According to questionnaire collecting information about the participants' background, most of the participants were teachers of English; aged between 27 and 56, and none of them had experience or knowledge at web site development. Two training sessions were organized. In the first training session ten and in the second session six teachers participated.

Instruments

The data required for this study was gathered by the Turkish version of the WAS, developed originally in English (Liaw, 2002a). It consists of 16 items with seven-point Likert scale from strongly disagree to strongly agree. Questions are related to perceptions about web self-efficacy, enjoyment, usefulness and intention to use the web. There were four items for each construct. In a pilot study, the WAS (Liaw, 2002a) was adapted into Turkish (Bayramoglu, 2007). First, the WAS was translated into Turkish. Then Turkish version of the scale was translated back into English by two English Language teachers. By comparing the original and translated English version, the Turkish version of the scale was revised and prepared. The teachers of varying disciplines in easily accessible schools were asked to administer the questionnaires in their schools. The questionnaires were distributed to the teachers and collected within three months. Out of 185, twenty-nine questionnaires with missing responses were eliminated from the statistical analyses. A total of 156 (102 female and 54 male) teachers from preschool level to secondary schools in Istanbul provided fully replied questionnaires. The age of teachers evenly distributed from 20 to 60. Further, a factor analysis was performed in order to check the predefined components (web self-efficacy, enjoyment, usefulness and intention to use the web) of the questionnaire and items in each component. Varimax rotation with Kaiser Normalization was conducted. The number of factor was set as four for the analysis. Eigenvalues was found to be 72.76 for four components. Results supported that items were divided and grouped properly except one item, (The multimedia environment of WWW is helpful to understand online information) from the web usefulness component needed to be changed with another item (I believe that learning how to use the Internet/WWW is worthwhile) in behavioral intention to use the web. The items used in the WAS were evaluated in terms of reliability. A reliability test was

performed for each sub components according to the results of factor analyses and for the scale as a whole. All subscales had Cronbach's alpha values at least 0.80, and item-total correlation was 0.90, providing evidence for the internal consistency reliability of the scale.

The training materials and method

The aim of the training developed was to teach how to create a web site by using free services provided on the Internet without having to utilize any commercial software. Web sites and portals providing users with the opportunity to create their own pages were investigated. Adding and editing text, link, and picture were the minimum required facilities that were needed. MyNet, a portal site that provides free services such as news, games, chat, email, weather information, web page creation, forums and search was selected as the training instrument, because it provided all the required features. MySite is one of MyNet services enables Turkish users to create their own web sites over the Internet. A document with detailed explanations and screen-shots for each step of the training was prepared to distribute to the teachers.

The training in the study was based on behavior modeling training (BMT) method as found more effective in previous studies (e.g. Chou & Wang, 2000; Chou, 2001). The BMT has become a widely used and highly regarded psychologically based training intervention (Baldwin, 1992; Taylor, Russeft & Chan, 2005). BMT was grounded on Bandura's social learning theory (1977), and according to Decker and Nathan (1985), it differs from other training methods with specific emphasis on (a) stating to trainees a set of well-defined behaviors to be learned, (b) giving instructions that what specific learning points or critical behavior trainees have to watch: Models demonstrating the effective use of those behaviors, (c) the trainees are encouraged to practice the suitable behavior in a role play or through any other method of simulation, (d) providing feedback and reinforcement, and (e) taking steps to maximize the transfer of those behaviors to the job. BMT was found to be effective in terms of cognitive and behavioral learning and productivity improvements, and on computer training (Compeau & Higgins, 1995b). A meta-analysis on BMT (Taylor et al, 2005) reported that 117 studies evaluated the effects of behavior modeling training on some training outcomes, across characteristics of training design. Effects of BMT were largest for learning outcomes; Although BMT effects on declarative knowledge decayed over time, training effects on skills and job behavior remained stable or even increased. Also, this approach seems to be well-suited to computer training, because BMT is in many ways a middle ground between instruction and exploration training because it encourages the formal cognitive learning provided by instruction as well as hands-on practice of exploration (Simon & Werner, 1996).

In BMT, there are tasks to be undertaken by students, and each task consists of a series of behaviors: the instructor correctly performs the task and at the same time explains in details how it is done and what are the critical issues of features of carrying out the tasks. Also alternative ways of doing is to be mentioned but it is not shown while one alternative way is being studied. During the training of this study, each step was demonstrated by the instructor and the participants were encouraged to carry out each step individually. Also, the immediate effect of confidence came from the success of one step leading to a decrease in perceived goal difficulty in the next step (David et al., 2007). Before taking the next step, accomplishment of each step by the participant was ensured. If needed, the instructor helped the participant individually. The topics covered in the training in a step by step fashion included (1) Opening the portal page (mynet.com), (2) Opening Mysite services home page (mysite.mynet.com), (3) Creating an account in MyNet to use its services, (4) Adding and editing page elements: Text element (Font, Size, Color, Alignment); Picture, (5) Debugging the site.

Procedure

The administrators in an Anatolian High School in Istanbul were informed about the study and the training. Permission to use the school computer lab was obtained. The computer lab was visited and tested before the training in terms of its adequacy. There were twenty-one computers connected to the Internet in the lab, and one of which was reserved for the instructor. A projector was also ready to use. The training was announced on the bulletin board of the school, and according to volunteered applicants' responses, a training day was set and announced to them. Two training sessions were conducted, which covered the same information, ten teachers participated in the first session and there were six teachers in the second session. Two trainings were lectured by the same trainer. Before and after the training, the WAS was applied and collected.

The training started with creating an account so that teachers would be able to use the free services of MyNet. This procedure required filling in a long form and then clicking the link which was sent via e-mail after submitting the form for verification. The teachers needed to have an e-mail account for verification of their identity so the ones without an e-mail account or forgot their passwords were encouraged to use the e-mail account provided by MyNet. This task was the one with which the teachers needed the most help. During the training, the main problem was the slowness of the Internet connection: The response time when the forms were

submitted was relatively long. The training took almost three hours and it consisted of small tasks that needed to be accomplished. The trainer helped the teachers individually whenever they encountered problems and a new task was performed only if the previous task was accomplished by all participants.

Data analysis and findings

The data was analyzed to see whether there was a significant difference before and after the training for the WAS as a whole and as each sub scale. A score was calculated as the average of the scores of the related items for each sub scale. The average of all items formed a score for the total scale. In the analysis, t-tests and Wilcoxon tests were used. Due to the fact that the sample was small, before applying the t-test, the distribution of the scores was examined in terms of normality using the Skewness and Kurtosis values. For the scales which had a normal distribution, t-test was performed, and otherwise Wilcoxon test was conducted.

A paired samples t test revealed that there is a significant difference between teachers' web self-efficacy level before and after the compact training ($t=-2.41$; $p<.01$; Cohen's d effect size=0.37). The teachers' web self-efficacy mean score after the training ($\bar{x}=4.86$; $sd=1.64$) was greater than the mean score before the training ($\bar{x}=4.28$; $sd=1.45$). Also, the same type of t test demonstrated a significant difference ($t=-3.81$; $p<.01$; Cohen's d effect size=0.53) between the teachers' web usefulness scores before and after the compact training. The teachers' web usefulness mean score after the training ($\bar{x}=5.80$; $sd=1.11$) was greater than the mean score before the training ($\bar{x}=5.14$; $sd=1.33$).

The Wilcoxon Signed Ranks test showed that there is not any significant difference between teachers' scores of web enjoyment to use the web before and after the compact training ($Z=-0.42$; $p>.05$; Cohen's d effect size=0.08). Although, the teachers' web enjoyment mean scores after the training was slightly greater ($\bar{x}=6.42$; $sd=0.95$) than the mean scores before the training ($\bar{x}=6.34$; $sd=0.92$). Also, another Wilcoxon Signed Ranks test revealed that there is not any significant difference between the teachers' level of behavioral intention to use the Web before and after the compact training ($Z=-1.61$; $p>.05$; Cohen's d effect size=0.15). The teachers' scores of behavioral intention to use the Web after the training was slightly greater ($\bar{x}=6.53$; $sd=0.88$) than the scores before the training ($\bar{x}=6.38$; $sd=0.83$).

Further, a paired samples t test revealed that there is a significant difference between teachers' web attitude level before and after the compact training ($t=-3.98$; $p<.01$; Cohen's d effect size=0.35). The teachers' web attitude mean score after the training ($\bar{x}=5.90$; $sd=1.03$) was greater than the mean score before the training ($\bar{x}=5.54$; $sd=0.96$). It is possible to say that training enhanced the web attitude of the teachers. The mean scores and the standard deviation of the post-treatment scale and subscale were not very much different from the pre-treatment scales, however, the statistical tests conducted seemed to maximize such small differences and yielded a significant difference.

DISCUSSION and CONCLUSION

This study started with the adaptation of the WAS. When the WAS was used before and after a behavior modeling type of a training, an evidence was provided for the internal consistency reliability ($r=0.90$) of the Turkish adaptation of WAS. The analysis showed that the training was effective on enhancing the user's positive attitude towards the web and perceptions of web self efficacy and web usefulness, but did not make much of a difference in terms of perceived enjoyment and behavioral intention to use the web. Previous research results show similarities and differences when compared to the findings of this study. In terms of positive change in attitude after a training intervention, the results of the present study were similar to the study by Torkzadeh, Pflughoeft and Hall (1999) which showed that respondents with positive attitudes towards computers indicated improvements in their attitudes after the training. Also, the present study verified much earlier claims (e.g. Chein, 1948; Triandis, 1971) that the training provided did indeed influence attitudes positively. Considering the computer and internet self efficacy, there were other studies showing positive influence of training. For example, in Chou and Wang's study (2000) two training methods used caused a significant difference on computer self efficacy. In addition, Karavidas, Lim and Katsikas (2005) concluded that as people learnt more about computers, self-efficacy increased and this caused a decrease in computer anxiety; showing that the training enhances self efficacy. This is, too, consistent with the findings of the present study.

Contrary to the present study, Torkzadeh and Dyke (2002) did not find training as an influential factor to change user attitudes towards computers: They stated that user attitudes towards computers seemed to have improved over time. Although the course content was related with the Internet, they focused on the change in computer attitude, rather than the Internet. This could be another reason why they did not find any difference.

PU was another construct in which training provided a positive increase (Davis, 1989). Though there were many studies verifying the relationship between system use, attitude and constructs of TAM, especially PU (Davis, 1989; Lederer, Maupin, Sena & Zhuang, 2000; Lin & Lu, 2000; Moon & Kim, 2001; Saade & Bahli, 2005; Roca, Chiu & Martinez, 2006; Burton-Jones & Hubona, 2006), the present study was the one which focused on the effect of training on PU. The positive effect of training on PU was verified in this study. It may be argued that enhancing PU through appropriate training would provide an increase on information system use. However, the results of this study should be interpreted with caution as the differences in scores of the pre and post measurement *were not great*.

This study was conducted in order to examine the effect of a compact training on teachers' attitude towards the internet. There were two important outcomes of the study: (1) the training provided did indeed improve the teachers' attitude toward the web, which is important to consider while designing new training for teachers, especially when targeting attitude. (2) The instrument adapted and used in the study, Turkish version of the WAS. Its reliability was tested in an adaptation study and was used for measuring teachers' web attitude.

Training materials were developed in order to teach how to create web sites using free services of a portal site. The training created a positive and significant difference on web self efficacy and perceived web usefulness scores. Nevertheless, the post training scores of perceived web enjoyment and behavioral intention to use web were higher than the pre training scores, the differences were found not to be significant. Further studies should focus more on creating change in these two constructs. There were two important properties of the training which possibly provided the improvement. One of them was the instruction method used during the training. The behavior modeling method, which involved a visual observation of the behaviors of a model performing a task was used and learning occurred by imitating and extending the model's behavior in practice (Chou and Wang, 2000). The second was the use of a meaningful large task but dividing the content of the training into small tasks. Before moving to the next task, accomplishment of the previous task by the participant was required. If needed, the instructor helped the participant individually. The success of one task led to a decrease in perceived difficulty of the next task and enhanced self-efficacy (David et al., 2007). While developing new training for teachers, focusing on the properties of the training stated above may provide a similar success on changing attitude positively.

The content of the training may be another positive factor: Creating a web page was previously considered a high level task due to programming skills needed. However, in our training, the free service provided by the portal did not require the participants to have any information about programming skills. As a result, each participant was able to create a web page after the training, and this helped them form a sense of self efficacy.

While developing training materials for in service teacher training, the principles behind this study could be used. These principles are briefly; (1) giving teachers the opportunity to individually perform each task, and (2) providing individual assistance whenever needed. This method could also be tested and used in adult education programs in order to help the participants acquire some basic computer and Internet skills.

The training offered as part of this research was voluntary. Those who responded to an announcement at a school were recruited as participants. However, it was not easy to persuade teachers, who taught thirty hours a week and also had other responsibilities, to participate in the training after the school day. Therefore many teachers did not want to attend the training, so the number of teachers participated was limited to sixteen. Because a limited number of participants prevented using more robust statistics, and making generalizations, it is, therefore, necessary to carry out further treatments with larger samples in order to conduct other statistical tests and to confirm findings of this study. As a solution some motivational incentives could be used to encourage participation. Preparing training as a part of a compulsory course for in-service training would also provide an increase in the number of participants.

Although the participants did not have any experience in creating web sites, they had the basic skills needed to operate computers, such as using the keyboard and the mouse. Participants with limited knowledge and experience with computers and the Internet might be chosen for further study in order to test the effect of the compact training on teachers who are not all familiar with information technology. In this study the participants were not grouped according to their attitude levels before the training. Working with a group of participants whose computer and Internet attitude levels are low may lead to more significant attitude changes after the training, which can be investigated.

The Turkish version of WAS, could be used in order to measure the attitude towards the internet in further research. In the present study, the instrument was used specifically in order to measure the change that occurred

after training. It could be used in different research settings by adding new variables, such as the type of information system used, the type of content designed and developed, the duration of the training, age, previous experience of the participants, and the effects of these variables on attitude could be examined. Also, the argumentation the individual goes through, the time and amount of message exposure, credibility of the instruction source, and message conditions necessary for web attitude change are primary variables for further studies. Finally, it is also possible to research the influence of training with different participants from different occupations, and to compare the attitude of different participant groups.

Acknowledgement: The authors thank both the teachers who participated in the WAS adaptation study and the ones in the two training sessions.

REFERENCES

- Akkoyunlu, B. (1996) Öğrencilerin bilgisayara karşı tutumları. *Eğitim ve Bilim*, 20(1), 15-29.
- Altun, A. (2003) Öğretmen adaylarının bilişsel stilleri ile bilgisayara yönelik tutumları arasındaki ilişkinin incelenmesi. *Turkish Online Journal of Educational Technology* 2(1), Article 9. Retrieved at May 29, 2008, from www.tojet.net
- Asan, A. (2002). Fen ve sosyal alanlarda öğrenim gören öğretmen adaylarının bilgisayara yönelik tutumları. *EJER*. Sayı, 7. Retrieved at May 29, 2008, from www.aniyayincilik.com.tr
- Baldwin, T. T. (1992). Effects of alternative modeling strategies on outcomes of interpersonal skills training. *Journal of Applied Psychology*, 77(2), 147-154.
- Bandura, A. (1977). *Social Learning Theory*. Englewood Cliffs, NJ: Prentice-Hall.
- Bandura, A. (1997). *Self-efficacy: The Exercise of Control*. New York: W.H. Freeman.
- Bayhan, P., Olgun P. & Yelland, J. N. (2002). A study of pre-school teachers' thoughts about computer-assisted instruction, *Contemporary Issues in Early Childhood*, 3(2), 298-303.
- Bayramoglu, Y. (2007). A training to promote teachers' positive attitude towards web use: Self efficacy, web enjoyment, web usefulness and behavioral intention to use the web. *Unpublished master thesis*. Bogaziçi University. Istanbul.
- Bohner, G. and Wanke, M. (2002) *Attitudes and Attitude Change*. New York, Psychology Press.
- Bowers, J. W. and Michael M. O. (1966). Attitudinal effects of selected types of concluding metaphors in persuasive speeches. *Speech Monographs*, 33(1), 47-55.
- Burton-Jones, A. & Hubona, G. S. (2006). The mediation of external variables in the technology acceptance model. *Information & Management*, 43(6), 706-717.
- Chein, I. (1948). Behavior theory and the behavior of attitudes: Some critical comments. In M. Fishbein, (Ed.). (1967). *Readings in attitude theory and measurement* (pp. 51-58). New York: Wiley.
- Chou, H. W. & Wang, T. (2000). The influence of learning style and training method on self-efficacy and learning performance in WWW homepage design training. *International Journal of Information Management*, 20(6), 455-472.
- Chou, H. W. (2001). Effects of training method and computer anxiety on learning performance and self-efficacy. *Computers in Human Behavior*, 17(1), 51-69.
- Compeau, D. R. & Higgins, C. A. (1995a). Computer self-efficacy: Development of a measure and initial test. *MIS Quarterly*, 19(2), 189-211.
- Compeau, D. R. & Higgins, C. A. (1995b). Application of social cognitive theory to training for computer skills. *Information Systems Research*, 6(2), 118-143.
- David, P., Song, M., Hayes, A. & Fredin, E. S. (2007). A cyclic model of information seeking in hyperlinked environments: The role of goals, self-efficacy, and intrinsic motivation. *Human-Computer Studies*, 65(2), 170-182.
- Davis, F. D. (1989). Perceived usefulness, perceived ease of use, and user acceptance of information technology. *MIS Quarterly*, 13(3), 318-340.
- Davis, F. D., Bagozzi, R. P. & Warshaw, P. R. (1992). Extrinsic and intrinsic motivation to use computers in the workplace. *Journal of Applied Social Psychology*, 22(14), 1111-1132.
- Decker, P. J. & Nathan, B. R. (1985). *Behavior Modeling Training: Principles and applications*. New York: Praeger.
- Demirarslan, Y. & Usluel, Y. K. (2005). Bilgi ve iletişim teknolojilerinin öğrenme öğretme sürecine entegrasyonunda öğretmenlerin durumu. *Turkish Online Journal of Educational Technology*, 4(3), Article 15. Retrieved at May 29, 2008, from www.tojet.net
- Deniz, L. (2005) İlköğretim okullarında görev yapan sınıf ve alan öğretmenlerinin bilgisayar tutumları. *Turkish Online Journal of Educational Technology*, 4(4), Article 22. Retrieved at May 29, 2008, from www.tojet.net
- Elms, A. C. (1966). Influence of fantasy ability on attitude change through role-playing. *Journal of Personality and Social Psychology*, 4, 36-43.

- Flavian C., Guinaliu M. & Guerrea, R. (2005). The role played by perceived usability, satisfaction and consumer trust on website loyalty. *Information & Management*, 43(1), 1-14.
- Gomleksiz, M. N. (2004). Use of education technology in English classes. *Turkish Online Journal of Educational Technology*. 3(2). Retrieved at May 29, 2008, from www.tojet.net
- Hua, P. J., Clark, T. H. K. & Ma, W. W. (2003). Examining technology acceptance by school teachers: A longitudinal study. *Information & Management*, 41(2), 227-241.
- Kabadayı, A. (2006). Analyzing pre-school student teachers' and their cooperating teachers' attitudes towards the use of educational technology. *Turkish Online Journal of Educational Technology*, 5(4), Article 1. Retrieved at May 29, 2008, from www.tojet.net
- Karavidas, M., Lim, N. K. & Katsikas, S. L. (2005). The effects of computers on older adult users. *Computers in Human Behavior*, 21(5), 697-711.
- Lederer, A. L., Maupin, D. J., Sena, M. P. & Zhuang, Y. (2000). The technology acceptance model and the World Wide Web. *Decision Support Systems*, 29(3), 269-282.
- Liaw, S. S. (2002a). Understanding user perceptions of World-wide web environments. *Journal of Computer Assisted Learning*, 18(2), 137-148.
- Liaw, S. S. (2002b). An Internet survey for perceptions of computers and the World Wide Web: Relationship, prediction, and difference. *Computers in Human Behavior*, 18(19), 17-35.
- Lin, J. C. & Lu, H. (2000). Towards an understanding of the behavioral intention to use a web site. *International Journal of Information Management*, 20(3), 197-208.
- McCroskey, J. C. & Combs, W. H. (1969). The effects of the use of analogy on attitude change and source credibility. *The Journal of Communication*, 19, 333-339.
- McIlroy, D., Sadler, C. & Boojawon, N. (2007). Computer phobia and computer self-efficacy: Their association with undergraduates' use of university computer facilities. *Computers in Human Behavior*, 23(3), 1285-1299.
- Moon, J. W. & Kim, Y. G. (2001). Extending the TAM for a World-Wide-Web context. *Information & Management*, 38(4), 217-230.
- Petty, R. E. & Wegener, D. T. (1998). Attitude change: Multiple roles for persuasion variables. In D. Gilbert, S. Fiske & G. Lindzey (Eds.), *The Handbook of Social Psychology* (4th ed.), New York: McGraw-Hill.
- Roca, J. C., Chiub, C. M. & Martinez, F. J. (2006). Understanding e-learning continuance intention: An extension of the TAM. *Human-Computer Studies*, 64(8), 683-696.
- Rosenberg, M. (1967). Psychological selectivity in self-esteem formation. In C. W. Sherif & M. Sherif (Eds.) *Attitude, Ego Involvement and Change*. New York: Wiley.
- Saade, R. & Bahli, B. (2005). The impact of cognitive absorption on perceived usefulness and perceived ease of use in on-line learning: An extension of the TAM. *Information & Management*, 42(2), 317-327.
- Sherif, M. & Hovland, C. I. (1961). *Social Judgment: Assimilation and contrast effects in communication and attitude change*. New Haven, Yale University Press.
- Simon, S. J. & Werner, J. M. (1996). Computer training through behavior modeling, self-paced, and instructional approaches: A Field Experiment. *Journal of Applied Psychology*, 81(6), 648-659.
- Taylor, P. J., Russeft, D. F. & Chan, D. W. L. (2005). A meta-analytic review of behavior modeling training. *Journal of Applied Psychology*. 90(4) 692-709.
- Teo, T. S. H., Lim V. K. G. & Lai, R. Y. C. (1999). Intrinsic and extrinsic motivation in Internet usage. *Omega, Internet Journal of Management Science*, 27(1), 25-37.
- Thong, J. Y. L., Hong, W. & Tam, K. Y. (2002). Understanding user acceptance of digital libraries. *Human-computer Studies*, 57, 215-242.
- Torkzadeh, G. & Dyke, T. P. V. (2002). Effects of training on Internet self-efficacy and computer user attitudes. *Computers in Human Behavior*, 18(5), 479-494.
- Torkzadeh, G., Chang, J. C. J. & Demirhan, D. (2006). A contingency model of computer and Internet self-efficacy. *Information & Management*, 43(4), 541-550.
- Torkzadeh, R., Pflughoeft, K. & Hall, L. (1999). Computer self-efficacy, training effectiveness and user attitudes. *Behavior & Information Technology*, 18(4), 299-309.
- Triandis, H. C. (1971). *Attitude and Attitude change*. New York: Wiley.
- Tüy, M. A. (2003). Orta Öğretim okullarında öğretmenlik yapan öğretmenlerin öğretim teknolojilerini sistematik kullanımına ilişkin davranışlarının incelenmesi. *Eğitim Bilimleri ve Uygulama*, 2(5), 187-208.
- Venkatesh, V., Morris, M. G., Davis, G. B. & Davis, F. D. (2003). User acceptance of information technology: Toward a unified view. *MIS Quarterly*, 27(3), 425-478.
- Wang, A. Y. & Newlin, M. H. (2002). Predictors of web-student performance: The role of self-efficacy and reasons for taking an on-line class. *Computers in Human Behavior*, 18(2), 151-163.
- Wilfong, J. D. (2006). Computer anxiety and anger: The impact of computer use, computer experience, and self-efficacy beliefs. *Computers in Human Behavior*, 22(6), 1001-1011.

- Wixom, B. H. & Todd, P. A. (2005). A theoretical integration of user satisfaction and technology acceptance. *Information Systems Research*, 16(1), 85-102.
- Yanga, H. D. & Yoob, Y. (2004). It's all about attitude: Revisiting the technology acceptance model. *Decision Support Systems*, 38(1), 19– 31.
- Yi, M. Y. & Hwang, Y. (2003). Predicting the use of web-based information systems: Self-efficacy, enjoyment, learning goal orientation, and the technology acceptance model. *Human-Computer Studies*, 59(4), 431–449