THE EFFECTS OF TRAINING AND INTEGRATION OF TECHNOLOGY INTO COURSEWORK ON THE ATTITUDES OF TURKISH EFL TEACHERS

Derin Atay
Marmara University
Istanbul/Turkey
dyatay@yahoo.com

Gökçe Kurt
Marmara University
Istanbul/Turkey
gokcekurt@hotmail.com

Abstract

Abstract: Teachers' attitudes toward computers were found to influence their acceptance of the usefulness of technology and the extent they integrate technology into their classroom. This study aims to investigate the effects of a technology based training combined with course work on the attitudes and perceptions of 38 Turkish prospective teachers (PTs) of English in Turkey. The study took place in the second term of 2007-2008 academic year in the "Teaching English to Young Learners I" course in which they were asked to prepare materials using online resources for an interactive class. Data were collected by means of the Information and Communication Technologies Attitudes and Perceptions scale given before and after the four-hour training and semi-structured interviews. The findings revealed significant differences in PTs' attitudes towards computer use in language teaching as well as in their computer competence.

Keywords

Technology, prospective teachers, attitudes and perceptions.

1. INTRODUCTION

The rapid development of information technology has made computers and computer-related technology an integral part of teaching and learning in the last decades. However, despite the positive effects of technology use on student motivation, self-direction, sense of accomplishment and critical thinking skills (Van Scoter, Ellis & Railsback, 2001), recent research has shown that the integration of technology is still in its beginning stages and that it has not yet been fully acknowledged and accepted by teachers (Herman, 2002). According to researchers, the success of implementing the curriculum with information technology (IT) in education depends greatly upon the attitudes of the teachers and their willingness to embrace such technology (Dusick, 1998; Marcinkiewicz, 1994). Teachers' attitudes toward computers were found to influence their acceptance of the usefulness of technology, the way they approach and integrate the relevant online resources into their classroom (Akbaba & Kurubacak, 1998; Clark, 2000; Myers & Halpin, 2002) and the likelihood of their benefiting from a training on the use of technology (Kluver, Lam, Hoffman, Green & Swearinges, 1994). According to Yıldırım (2000), "Teachers teach as they have been taught" and it is "unlikely that computer skills will be transferred to students and encouraged by teachers unless the teachers have positive attitudes toward computer use" (p, 481). Thus, attitudes are a major enabling or disabling factor in the adoption of technology in instructional settings (Abas, 1995; Blankenship, 1998; Bullock, 2004, Christensen, 1998; Isleem, 2003; Kersaint, Horton, Stohl & Garofola, 2003; Watson, 1998; Woodrow, 1992).

Studies have shown a close relationship between teachers' attitudes and their computer competence. For example, Francis, Pelton and Pelton (1996) found that although many teachers believed that computers played an important role in education, they were not able to integrate technology into their instruction either because they lacked the necessary knowledge and experience or because they had doubts about the usefulness of technology. Similarly, Albirini (2006) in a study with high school EFL teachers in a large Syrian province found that participants considered computers as a viable educational tool having the potential to bring about different improvements to their schools and classrooms. On the other hand, many teachers were uncertain about whether or not computers fit well in their curricular goals.

In Turkey, the integration of technology into K-12 classroom teaching has been the focus of public and private educational organizations and the Ministry of Education. In the "Long Term Strategy and 8th Five Year Development Plan 2001-2005" of the Turkish State Planning Organization (2001) use of technologies in all areas of education was strongly expressed. However, research has shown that many Turkish teachers have still limited expertise and confidence in using technology (Mümtaz, 2000). For example, Tuzcuoğlu (2000) investigated teachers' attitudes towards CALL in the foreign language department at a university in Turkey. Results of the study showed that despite the availability of computer lab and a request from the administration, most teachers did not make use of computer for teaching purposes. Participating teachers were willing to teach with computers, yet lacked the relevant knowledge to do so. Based on a worldwide survey among national samples of schools from 26 countries, Pelgrum (2001) concluded that "educational innovations do not succeed if teachers are not provided with the skills and knowledge needed to carry them out" (p.165).

Thus, training opportunities to enable teachers to experience computer technology resources in instruction are crucial for teachers' acceptance and use of them (Akbaba & Kurubacak, 1998; Clark, 2000). Investigating the level of educational technology use in teaching English among language instructors across eight state universities in Turkey, Aydoğdu (2001) found that teachers who have undergone training used educational technology resources in language instruction more than those who have not. For more than a decade, teacher education programs in Turkey have been offering two courses to prepare teachers to use technology in effective ways. In these courses students are provided with basic knowledge on using computers for a variety of purposes, e.g., word processing, information retrieval and communication. Pre-service teachers are expected to apply these skills in the development of materials and tasks for language teaching and testing. Yet, technology education in pre-service teacher education seems not to be adequate (Gürşimşek, Kaptan & Erkan, 1997); pre-service teachers were found to hesitate when asked to use technology and integrate technology into their instruction (Yıldırım, 2000). According to some researchers (Abbott & Farris, 2000; Kumar & Kumar, 2003) pre-service teachers' attitudes toward technology could be improved by integrating technology into teacher education course work. Abbott and Faris (2000) examined the attitudes of elementary education pre-service teachers toward the use of computers before and after a semester-long site-based literacy course that integrated technology to support the development of pre-service teachers' understandings of elementary teaching. The participants' responses to the attitude surveys revealed an increase in positive attitudes toward computers after taking this course. The present study aims to investigate the effects of a technology based training combined with course work on the attitudes of prospective teachers of English in the Turkish context, a setting that has not been investigated in terms of the relevant issue before. The study further aims to shed light on how pre-service teachers can put their knowledge into practice.

2. METHODOLOGY
2.1. Participants
Thirty-eight Turkish pre-service teachers of English, enrolled at the English language teaching department of a competitive state university in Istanbul, Turkey, participated in this study. All participants, 11 male and 27 female, were third year students who had already taken two computer courses in their freshman year. Except these courses, none of the students had ever attended a training or seminar on technology. The average age of the students was 20.8 and they were randomly chosen from four intact groups of students. One of the researchers was the instructor of the class and the other researcher, instructor at the same institution as well, gave the training on technology integration.

2.2. Procedure

The present study took place in the second term of 2007-2008 academic year in the "Teaching English to Young Learners I" course and lasted for 10 weeks. The course aims at providing prospective teachers (PTs) with theoretical knowledge on young learners' cognitive development and their characteristics as well as with practical skills in teaching speaking and listening to young learners. In the first week the PTs were administered the Information and Communication Technologies (ICT) attitudes and perceptions scale (to be discussed below), given brief information on the study and asked to work on a technology-integrated project. That is, they were supposed to develop a material to be used in their future English classes as their term projects, taking young learners characteristics into account and using online resources for an interactive class. The instructors also had semistructured interviews with the PTs individually.

In order to develop their practical skills in the integration of computer applications and online resources for material development, PTs were provided with a 4-hour training given by one of the researchers. The training included theoretical issues related to educational technology as well as information on online resources and was given through three weeks. The format of the training was as follows: In the first session, PTs were given information about the historical development of the uses of technology in second language teaching. The historical overview focused on how the uses of technology evolved over the last several decades in terms of serving English language learners and how technology and second language acquisition theory and pedagogy developed in parallel directions.

In the second hour, the researcher and the PTs discussed the improved language learning opportunities offered by the Internet and the increasing multimedia capability of computers. Then, the attributes of successful technology-enhanced language learning environments and advantages of technology integration to language learning and teaching process especially for EFL settings were discussed. After this, the researcher introduced some websites that PTs can use for material development for young learners, e.g., the website of British Council for young learners, as well as information on the target audience, objectives, content, technical aspects, teacher and learner support materials, graphics and multimedia, and theoretical basis of each. The researcher then modeled technology use

In the last two sessions PTs worked in groups of three and discussed how they would use different websites in their material development project. The researcher offered suggestions related to the practical use of online resources and how to match them with the language learning needs of the young learners.

In the next three weeks of the study, PTs prepared a 15- 20-minute lesson plan consulting the websites introduced or they themselves found. They were free to work on any topic, e.g., teaching numbers, colors, or any skill, e.g., listening to a song and matching pictures with words. During this process, they contacted the researchers regularly for their questions.

In the last four weeks of the term, PTs presented their materials and received feedback both from their classmates and instructors on the content of their presentation, the materials they developed, the way they integrated technology into their instruction, and the suitability of their lesson plan to the needs of young learners.

When the study was completed, PTs were administered the same questionnaire as a post test and interviews were again conducted with each PT.

2.3. Data Collection and Analysis

Data for the study were collected by means of a questionnaire developed by Albirini (2004), and semi-structured interviews. The questionnaire aimed to assess the attitudes of teachers toward ICT in education with 69 items forming four scales: Computer attitude, computer attributes, cultural perceptions and computer competence. Some of the items were adapted to the Turkish context and the questionnaire was piloted with 31 pre-service teachers in the same institution. The Cronbach alpha reliability coefficients for the scales were as follows for the present study: .87 for computer attitude, .82 for computer attributes, .72 for cultural perceptions and .89 for computer competence while the reported Cronbah alpha coefficients for the study of Albirini (2004) were .90, .86, .76, and .94, respectively.

The first scale of the questionnaire focusing on the attitudes of PTs toward ICT in education included 20 questions designed to measure the affective (6 items), cognitive (9 items) and behavioral (5 items) domains of computer attitude. The second scale of the questionnaire, with 18 questions, focused on the computer attributes of the PTs. This part of the questionnaire dealt with the perceptions of the PTs about the relative advantage of computers (5 items), their compatibility with PTs' future practices (5 items), their simplicity/non-complexity (5 items) and their observability (4

items). The third part of the questionnaire, i.e., cultural perceptions scale, included 16 items and the last part, computer competence scale, with 15 items, focused on the perceived computer competence of the PTs. Subjects were asked to indicate how much they agreed with the given item on a 5 point likert scale ranging from 'strongly agree' to 'strongly disagree', except the last part in which ratings were recorded on a 4-point scale ranging from 'no competence' to 'much competence'.

The questionnaire was administered to the PTs at the beginning and at the end of the study. The collected data were analyzed via SPSS 12 statistical package and a t-test was applied to the data.

Semi-structured interviews were conducted with the PTs, before and after the study, to gather in-depth information about their attitudes towards ICT and find out the difficulties they had during the technology integrated project. Data from semi-structured interviews were analyzed by means of pattern coding as suggested by Miles and Huberman (1994).

3. RESULTS AND DISCUSSION
3.1. Attitudes toward ICT

As illustrated in Table 1, the PTs' overall attitudes toward ICT were somehow midway between neutral and positive at the beginning of the study (M= 3.7). Results of the t-test revealed a significant change in the pre- and post-test scores indicating that PTs developed more positive attitudes toward ICT after they participated in the study (M= 4.2). When the scores are analyzed for each domain, it can be seen that significant changes occurred for the domains of affect and behavior ($p < .000$ for both). The high sores in the affective domain means that PTs had no apprehension of computers, were glad about the increase of computers, considered using computers enjoyable, felt comfortable about computers, and liked to talk with others about computers and they would use them in their future teaching while in the behavioral domain, the high scores reflected behavioral intentions in terms of buying computers, learning about computers and using them.

There did not occur any significant changes regarding the cognitive domain. As can be seen from the mean scores, PTs agreed that computers save time and effort, motivate students to do more study, enhance students' learning, are fast and efficient means of getting information, must be used in all subject matters, make schools a better place, are worth the time spent on learning them, are needed in the classroom, and generally do more good than harm.

Put Table 1 about here.

3.2. Computer Attributes

This part of the questionnaire asked PTs about their perceptions regarding the relative advantage of computers, their compatibility with PTs' future practices, their simplicity/non-complexity and their observability. As can be seen in Table 2, there were significant differences between PTs' pre- and post-test scores in terms of the compatibility and simplicity of computers. Interestingly PTs were less positive about the compatibility of computers with their future practices than they were about the attributes of computers. Despite the significant change in their perceptions after the study, the mean score of the post-test was still not very high (M= 3.4). In both tests, while the majority of the PTs indicated that computers have a place in today's classrooms, computer use is appropriate for many language learning activities, and the use of computers would suit their future students' learning preferences and their level of computer knowledge, their answers were mostly midway between neutral and negative regarding the items such as "computer use would fit well into the curriculum goals defined by the Turkish Ministry of Education" and "class time is too limited for computer use."

A significant change can also be seen between the pre- and post-test mean scores of the PTs related to the perceptions of the simplicity (i.e. 'complexity' before the negative items were reversed) of computers (M= 3.5 and M= 4.0, respectively). While, before the study, most of the PTs found it hard to learn to use the computer in teaching, and the majority of them were not sure whether the use of computers would complicate or facilitate their task in their future classrooms, their responses became more positive after they received the training. In general, the majority of the PTs stated that they did not have much difficulty in understanding the basic functions of computers and everyone can learn to operate a computer.

PTs perceived computers as an advantageous educational tool both before and after the study. Positive perceptions reflect the opinions of the PTs that computers improve education, affecting the quality of students' learning positively and making the subject matter more interesting. PTs' answers to the items on the observability of computers reflected positive perceptions before and after the study (M= 3.6 and M= 3.7, respectively) indicating that PTs have seen computers at Turkish

schools to be used as a learning tool. They all regard computers to be effective learning tools worldwide.

Put Table 2 about here.

This part of the questionnaire asked PTs about their perceptions regarding the relative advantage of computers, their compatibility with PTs' future practices, their simplicity/non-complexity and their observability

While, before the study, most of the PTs found it hard to learn to use the computer in teaching, and the majority of them were not sure whether the use of computers would complicate or facilitate their task in their future classrooms, their responses became more positive after they received the training. In general, the majority of the PTs stated that they did not have much difficulty in understanding the basic functions of computers and everyone can learn to operate a computer.

3.3. Cultural Perceptions
In general, the responses of the PTs to the 16 items showed that they had positive perceptions about the relevance of ICT to Turkish society and schools before and after the study (M= 4.2 and M= 4.4, respectively). PTs believed that students need to know how to use computers for their future jobs and knowing how to use computers provides a person with a privilege not available to others. In relation to education, computers are believed to bring some changes to classroom and schools and computers should be priority in education.

Put Table 3 about here.

3.4. Computer Competence
As Table 4 illustrates, the analysis of the mean scores obtained from the pre-test revealed that the competence level of the PTs was between little and moderate competence (M= 2.6). When their mean scores were analyzed for the post-test (M= 2.9), a statistically significant change was observed indicating that using computers to develop materials helped them to feel more competent in handling computer functions.

Put Table 4 about here.

3.5. Interviews
The interviews done at the beginning of the study showed that all PTs had doubts about the integration of computers into language classrooms, mainly because of their perceived incompetence, although none of them was against it. The following statements illustrate this issue:

Technology is a motivator for students to learn. Today's students use computers everywhere and they want to use them in the classroom as well. But as a prospective teacher I really don't know how to find the relevant websites and use them in my future classes.

Computer use absolutely facilitates learning but I'm not sure how I can prepare materials when teaching different skills, although I use computers all the time.

Interviews at the end of the study revealed a number of factors that seemed to have affected their attitudes towards ICT positively. To begin with, unlike their previous courses on computer use, this course was mainly based on "practice", "doing" and "experiencing", e.g.,

I have always wanted to use technology in my future classes but I had some doubts. With this project, I had first-hand experience in using technology for teaching vocabulary to young learnes. I learned a lot about how to decide on a certain activity, how to adjust it to students' level, etc.

PTs also mentioned that they enjoyed the collaborative process with their peers and instructors, e.g.,

It was a very enjoyable experience for me. Working with a friend made things much easier for me as this is the first time we used technology for teaching and presented it. While working together, we learned a lot about the online resources. We searched a number of websites and discovered amazing activities for language learners.

I liked this project very much but without the help of the instructors, things would be hard to achieve. They guided us about the websites and the presentation techniques.

Moreover, most of the PTs believed that the instructor's use of technology made them feel more comfortable that they could use technology in their own teaching.

When we were first told to carry out such a project I felt nervous. I wasn't quite clear about how to teach a grammar point inductively, for example, to sixth graders. Yet, Mrs. X's (the instructor) using it and showing practical examples made me feel relieved as I could see technology can be used for different teaching purposes.

PTs were also asked about the difficulties they experienced. A number of external factors caused difficulties for the PTs particularly at the initial stages of the process. To begin with, the websites they used offered a variety of activities in large numbers so it was difficult to choose an "interesting and interactive" online activity for their presentation at once. The folowing comment illustrates this point:

The websites that we used had so many activities that we could not decide which one to use. We had to consult our instructor for her help to choose the most interesting one.

Second, they mentioned the lack of access to internet in the classroom as the classrooms in the faculty are not equipped with the internet connection. Thus, they had worries about the presentation of their lesson plans in the classroom. For example:

For our project, we prepared a lesson plan based on an online game for young learners. When it came to the presentation, however, we could not share it with our friends as our classrooms are not equipped with the internet connection.

Another external difficulty was that most of the websites were designed for ESL students and some of them were highly culture specific. Therefore, adapting them to the EFL context and to the Turkish culture was not an easy, yet beneficial, process.

In one of the websites we searched for our project, we came across with a story about Halloween. It was actually a story making activity that asked students to complete certain parts of the story. However, it required some knowledge on Halloween, i.e., how it is celebrated, what people wear, etc. We wanted to use it but we could not decide how to adapt it to Turkish context at first; with some lead-in activities we managed it and was great.

At the end of the study, there were still some PTs who felt incompetent particularly about the use of multimedia. For example, they planned to use a reading text from one of the websites suggested but were confused when it came to integrating the animation and the sound files into their presentation.

The presentations of the PTs proved that most of the PTs could integrate online resources into young learner EFL instruction effectively. For example, one pair used a website with a story making link. Children were asked to decid on the type of the story they would write about, e.g., a fairy story, horror story or science fiction story. Then, they were told to choose the setting, characters and some of the materials to be used in the story. Then, the written paragraph with the choices of the children appeared on the screen. The PTs used this web site and stated that they would ask their future students to work in pairs and go to that link, decide on the details of their story and then read the

written version of their story with their partner. Afterwards, they would ask the students to find another pair of students and compare their stories to see the differences and similarities.

In another presentation, PTs used an online resource in which children were asked to read and listen to the descriptions of the people and decide on the person described by looking at the six faces on the screen. The aim was to introduce the students the structures used to describe people. PTs planned to conduct the activity in a way that students would students read and listen to the descriptions and then decide on the person described with their partners. When they read and listened to all the descriptions, students checked their answers as a whole class by clicking on their guesses.

4. Conclusion

The present study investigated the effects of training as well as coursework on the attitudes of prospective teachers of English towards ICT. The course provided the participants with theoretical knowledge on different websites and with practical skills about how to implement these in the classroom setting. Moreover, prospective teachers were asked to use the knowledge and skills they gained in their term project, i.e., preparation of materials for a young learner ELT class. Findings of the study suggest that the training and coursework had significant effects on the attitudes and perceptions of the participants as well as their computer competence.

Given the recent importance to technology in education, developing countries have the responsibility not merely to provide computers for schools but also to foster a culture of acceptance among the teachers as well as enrich their competence to utilize computer technology resources in their classrooms. The findings of the study revealed that many prospective teachers did not know much about online resources and had difficulties in finding the most suitable ones. Moreover, many felt a mismatch between ICT and the curricula and the class-time frame. It follows that providing pre-service teachers with basic technological computer skills and placing computers in schools are not enough for attaining educational change. Teachers' preparation necessitates aiding teachers in experimenting with ICT before being able to use it in their classrooms.

References

Abas, Z. W. (1995). Implementation of computers in Malaysian schools: problems and successes. In D. Watson, & D.Tinsley (Eds.), *Integrating information technology into education* (pp. 151–158). London: Chapman & Hall.

Abbott, J. A., & Faris, S. E. (2000). Integrating technology into pre-service literacy instruction: A survey of elementary education students' attitudes toward computers. *Journal of Research on Technology in Education,* 33, 2, 149-161.

Akbaba, S., & Kurubacak, G. (1998). Teachers' attitudes towards technology. *Computers on Social Studies Journal* (online serial), 7, 4, retrieved August 25, 2007, from www.webcom.com/journal/akbaba.html

Albirini, A. (2006). Teachers' attitudes toward information and communication technologies: The case of Syrian EFL teachers. *Computers and Education,* 47,373-398.

Aydoğdu, I. (2001). *Level of educational technology use among language instructors in teaching English* (Agean region sample). Unpublished PhD Dissertation. Dokuz Eylül University, Turkey.

Blankenship, S. E. (1998). *Factors related to computer use by teachers in classroom instruction.* Doctoral Dissertation, Virginia Polytechnic Institute and State University.

Bullock, D. (2004). Moving from theory to practice: an examination of the factors that preservice teachers encounter as they attempt to gain experience teaching with technology during field placement experiences. *Journal of Technology and Teacher Education*, 12(2), 211–237.

Christensen, R. (1998). *Effect of technology integration education on the attitudes of teachers and their students.*Doctoral dissertation, University of North Texas. Retrieved on 12 November, 2003, from http://www.tcet.unt.edulresearch/ dissert/rhondac.

Clark, K.D. (2000). Urban middle school teachers' use of instructional technology. *Journal of Research on Computing in Education*, 33, 2, 178-192.

Dusick, D. M. (1998). What social, cognitive factors influence faculty members use of computers for teaching? A literature review. *Journal of Research on Computing in Education*, 3, 2. Retrieved August 5, 2007 from Ebsco Host.

Francis-Pelton, L. & Pelton, T. (1996). *Building attitudes: how a technology course affects pre-service teachers_ attitudes about technology*. Retrieved on 16 April 2007 from: http://web.uvic.ca/educ/lfrancis/web/attitudesite.html.

Gürşimşek, I., Kaptan, F. & Erkan, S. (1997). *General views on teacher education policies in Turkey.* Phoeniz, AZ.

Herman, L.P. (2002). *Case study of a professional development program: Meaningful technology integration in secondary education*. Unpublished PhD dissertation Drexel University. Retrieved August 28, 2007 from digital dissertation publication number AAT 3044285.

Isleem, M. (2003). *Relationships of selected factors and the level of computer use for instructional purposes by technology education teachers in Ohio public schools: a statewide survey*. Doctoral dissertation, the Ohio State University.

Kersaint, G., Horton, B., Stohl, H., & Garofalo, J. (2003). Technology beliefs and practices of mathematics education faculty. *Journal of Technology and Teacher Education*, 11(4), 549–577.

Kluever, R. C., Lam, T. C., Hoffman, E. R., Green, K. E., & Swearinges, D. L. (1994). The computer attitude scale: assessing changes in teachers_ attitudes toward computers. J*ournal of Educational Computing Research*, 11(3), 251–261.

Kumar, P. & Kumar, A. (2003). Effect of a web-base project on pre-service and in-service teachers' attitude toward computers and their technology skills. *Journal of computing in* Teacher Education, 9, 87-92.

Marcinkiewicz, H. R. (1994). Computers and teachers: Factors affecting computer use in the classroom. *Journal of Research on Computing in Education*, 26, 220-

Myers, J. M. Halpin, R. (2002). Teachers' attitudes and use of multimedia technology in the classroom. *Journal of Computing in Teacher Education*, 18,133-140.

Mümtaz, S. (2000). Factors affecting teachers' use of information and technology review of the literature. *Journal of Information Technology for Teacher Education*, 9, 3, 319-341.

Pelgrum, W. J. (2001). Obstacles to the integration of ICT in education: Results from a worldwide educational assessment. *Computers and Education*, 37,163-178.

Tuzcuoglu, U. (2000). *Teachers' attitudes towards using computer assisted language learning (CALL) in the foreign languages department at Osmangazi University*. Unpublished Master's Thesis. Bilkent University, Ankara, Turkey.

Watson, D. M. (1998). Blame the technocentric artifact! What research tells us about problems inhibiting teacher use of IT. In G. Marshall, & M. Ruohonen (Eds.), *Capacity building for IT in education in developing countries* (pp. 185–192). London: Chapman & Hall.

Woodrow, J. E. (1992). The influence of programming training on the computer literacy and attitudes of pre-service teachers. *Journal of Research on Computing in Education*, 25(2), 200–219.

Van Scoter, J., Ellis, D., & Railsback, J. (2001). *Technology in early childhood education: Finding the balance.* Portland, OR: Northwest Regional Educational Laboratory.

Yıldırım, S. (2000). Effect of an educational computing course on pre-service and in-service teachers: A discussion and analysis of attitudes and use. *Journal of Research on Computing in Education,* 37, 479-495.

TABLES

Table 1: Distribution of mean scores on the attitude toward ICT scale

Scale	Test	SD	M	df	t	p[a]
Affect	Pre	.66	3.3		-4.150	.000
	Post	.86	4.0			
Cognition	Pre	.90	4.0		-.572	.571
	Post	.83	4.1			
				37		
Behavior	Pre	.78	3.6		-4.071	.000
	Post	.62	4.2			
Overall	Pre	.61	3.7		-4.043	.000
Attitude	Post	.70	4.2			

[a] $p < 0.05$

Table 2: Distribution of mean scores on the computer attributes scale

Scale	Test	SD	M	df	t	p[a]
Advantage	Pre	.06	4.2		-1.671	.103
	Post	.48	4.3			
Compatibility	Pre	.56	3.0		-3.800	.001
	Post	.64	3.4			
Simplicity	Pre	.64	3.5	37	-3.867	.000
	Post	.69	4.0			
Observability	Pre	.67	3.6		-1.303	.201
	Post	.68	3.7			
Overall	Pre	.42	3.6		-5.080	.000
Atributes	Post	.43	3.9			

[a] $p < 0.05$

Table 3: Distribution of mean scores on the cultural perceptions scale

Scale	Test	SD	M	df	t	p[a]
Cultural	Pre	.75	4.2	37	-1.483	.146
perceptions	Post	.64	4.4			

[a] $p < 0.05$

Table 4: Distribution of mean scores on the computer competence scale

Scale	Test	SD	M	df	t	p [a]
Computer competence	Pre	.71	2.6	37	-2.941	.006
	Post	.46	2.9			

[a] p<0.05