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A Comparative Study on Perception of Teachers on the Use of Computers in Elementary Schools of Turkey and T.R.N.C.

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Abstract

The purpose of this survey study was to investigate the perceptions of teachers on the usage of computers in elementary schools of two countries (Turkey and TRNC). The data for this study was collected through a survey from the teachers in Erzurum and Lefkoşa (Nicosia). A total of 250 elementary school teachers from the schools of two cities participated in the research. The survey results indicated that teachers in both countries had a positive attitude toward the use of computers in schools. They commonly thought that computers may develop student motivation, skills, interest and achievement if they were used effectively. They also think that the future will be based on the knowledge of information technology. Turkish Cypriot teachers use computers mostly for correspondences, preparing exam questions and course materials. On the other hand Turkish teachers mainly used computers for preparing course materials, exam questions, calculating student grades and lesson plans. As Turkish teachers used computers more, Turkish Cypriot teachers used computers longer than Turkish teachers. Both groups of teachers generally considered that in-service training use of computers were not effective.

Key Words: Computer use in education, elementary teachers, computers, technology in schools

Introduction

Education influences every aspect of our lives and involves many disciplines such as industry, the army, trade, medicine, psychology and so on. Education is a process in which the learner gains skills and knowledge. Therefore, the spread of knowledge becomes crucial in this process. This process has to open its doors to every technology that affects knowledge. As was stated by Kocasaraç (2003), information technologies and computers function as significant tools for teaching-learning processes.

The goal of modern education is to educate people who can acquire lifelong learning abilities, obtain, learn and use the information. Benefiting from the information

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technologies in our school, using computers and the internet for educational purposes are very crucial in terms of improving the quality of education (Demirdaş, 2001). Besides, information technologies have affected education systems by improving curricular and instructional approaches (Saracaloğlu, O. Serin, Bulut-Serin & U. Serin, 2010).

Computers, because of rapid technological advances are used in many fields and have become an integral part of our daily life. For the development of societies it becomes vital that a large number of individuals can use computers (Aktümen & Kaçar, 2003).The usage of information and communication technologies for educational purposes has become widespread (Gilliani, 2003; Mukawa, 2006). The use of computers and internet helps individuals socialize within the family, in educational institutions and social life. These social interactions eventually help them build their social identity and personality (Arkonaç, 2001).

The efforts related to the advancement of computer use in schools and learning and instruction processes have continuously been increasing. One of the most important dimensions of these efforts is to focus on the quality and quantity of the physical structure of teaching environment, hardware and software. The other important dimension is the human power which uses this environment. Therefore it is expected from teachers that their technological proficiency be in an adequate level in order to be able to plan, execute and evaluate these processes and guide the students in their learning processes (Deniz, 2005). Today a qualified teacher should know how to use contemporary educational tools especially computers and basic software which are the basic requirements of education (Temur, 2001).

Due to the increase in the use of computers in educational processes, teachers gain various skills and are informed about computer use in in-service training courses (Deniz, 1994). Like other countries in the world, the schools in Turkey are also affected by technological advances and therefore they use these technologies in educational processes. Computer-based educational activities aim to increase the quality of the learning processes with the aid of methods and techniques such as teaching-learning activities based on computers, reaching information through research, presenting the obtained information, solving

problems in various disciplines on computers and doing experiments and role plays on computers (Deniz &Köse, 2003).

Many instructors agree upon the idea that the existing problems can not be solved with the use of traditional approaches. It is necessary to find a new way of increasing the number of teachers per student without harming the quality of education. The best way to do this is to use computers in order to help students acquire the skills of problem solving, creativity and critical thinking (Aktümen & Kaçar, 2003).

As the computers and internet technologies are one of the important tools in the classroom environment, they can be used effectively for audio-visual learning. These technologies can help teachers determine the comprehension skills of students for using and understanding scientific concepts and evaluate student activities (Dorris, 1991). Modern education should create a learning process by taking into consideration individual needs for effective and lifelong learning, and also combine information technologies with learning (Dooley & Greule, 1998). Although technology is not the only solution for overcoming educational problems, it is still an important tool for learning practices (Kirschner & Selinger, 2003).

In every modern school there should be educational technology facilities. In every classroom there should be a television, video and communication network. Every teacher should have a telephone and every student should have a computer. The use of technology in education will help teachers overcome the burden of traditional education. and make them more creative. The use of computer networks in education will make important contributions to the production of scientific knowledge (Ergün, 1998).

In order for computer-based activities to be effective, technological facilities are also needed. Yet we should not ignore the fact that these opportunities alone cannot guarantee the quality of practices. The presence of these technological practices and their quality are closely related to the characteristics of everyone (teachers, students and administrators) involved in this process. Knowing about the prior experiences of teachers related to computers or their problems while using computers, their attitudes towards the computer

and their awareness of some deficiencies that could arise while using technology in educational processes is a significant issue. Knowing teacher perspectives on the use of computers is significant for determining the current situation in schools and suggesting effective ways of improving teachers' use of technology (Deniz & Köse, 2003).

There are several research studies on the use of computers and teachers' attitudes towards computers. Some studies showed that in spite of their easy accessibility, computers are not used precisely by a great proportion of teachers (Hunt and Bohlin, 1993; Marcinkiewicz, 1993; OTA, 1988, 1995). One of the important characteristics that a teacher should have is computer skills in information age. In this sense, teacher attitudes towards computers are as important as the quality of education in information age (Liu & Reed, 1994; Selwyn, 1997).

Gülbahar (2008) reported that the lack of in-service training and insufficient technological infrastructures affected the effective use of technology by teachers. Asan (2003) investigated primary school teachers' perceptions and awareness level about technologies and the role of technology use in education, and how they perceived technological problems. The results showed that many teachers were not computer users and lacked computer literacy background which is necessary to build new technologies and skills. Cavas, Cavas, Karaoglan and Kışla`s (2009) study indicated that Turkish science teachers had positive attitudes toward ICT. Although teachers' attitudes toward ICT did not differ regarding gender, it differs regarding age, computer ownership at home and computer experience.

Ocak and Akdemir (2008) examined the perceptions of science teachers on the integration of computer applications. The findings demonstrated that improving the computer literacy of science teachers seemed to increase science teachers' computer use and consequently increased their integration of computer applications as an instructional tool. Internet, email, and educational software CDs found to have high percentage in teachers' use of computer applications in the classrooms. Also, the results indicated that gender difference existed between science teachers' integration of computer applications as an instructional tool.

Studies related to computer use in the Turkish educational system are conducted by the Ministry of Education. For this purpose, teachers were offered in-service training by the Ministry and some bids were opened to provide computer systems in some of the schools. The aim of this study is to seek the perceptions of teachers on the use of computers in primary schools. In order to fulfill this aim, the following sub-problems are dealt with.

1. Is there a significant difference in the perceptions of teachers on computer assisted education and computer attitudes?
2. Is there a significant difference in the perceptions of teachers on the purposes of computer use in schools?
3. Is there a significant difference in the perceptions of teachers on the needs related to computer and computer materials?
4. Is there a significant difference in the perceptions of teachers on computer use?
5. Is there a significant difference in the perceptions of teachers on computer use time periods?
6. Is there a significant difference in the perceptions of teachers on how and where they have learnt to use computers?
7. Is there a significant meaningful difference in the perceptions on in-service training related to computers?
8. Is there a significant meaningful difference in the perceptions of teachers on the number of computers in schools and the frequency of their use?

Method

In this study, the survey design was used to investigate the perceptions of the teachers in two countries on the use of computers in elementary schools.

Research Group

This study was conducted in five elementary schools in Nicosia, TRNC with 84 teachers (57 female, 27 male) and in 17 Basic Education Schools with 166 teachers (110 female, 56 male) in Turkey, Erzurum. Population of the study involves teachers in the elementary schools of Erzurum and Lefkoşa (Nicosia). As a sampling strategy, a convenience

sampling strategy was used (Büyüköztürk, Kılıç-Çakmak, Akgün, Karadeniz & Demirel, 2008). Majority of teachers in Nicosia (76.2%) are in the age range of 36-46, while in Erzurum the majority of teachers (88.2%) are in the age range of 26-46. For this study, the schools were visited and the questionnaires were distributed to teachers.

Data Collection Instruments

The questionnaire which was developed by Çağıltay, Çakıroğlu, Çağıltay and Çakıroğlu (2001) was administered to 250 primary school teachers in Nicosia and Erzurum and included 14 questions. The questions are related to the issues of computer-assisted education, aims of computer use in schools, needs of teachers related to computer and computer materials, computer use and computer use time periods, in-service training of teachers on how to use computers, number of computers in use and the frequency of their use. Some of the questions in the questionnaire were yes-no type, and some of the questions required answers such as (yes, no idea, no) and the remaining questions were 5 Likert type questions (strongly disagree, disagree, neutral, agree, strongly agree). But in this study, first of all primarily important eight questions thought as significant were answered. The Croncbach's Alpha Coefficient was found as 0.86, which sounds a high reliability (Büyüköztürk, 2002).

Data Analysis

Data obtained from the questionnaire applications carried out in both countries were analyzed by using t-test and descriptive statistics, and the findings were tabulated.

Findings

Findings Related to the Research Question 1

The arithmetic mean scores of attitudes of teachers working in TRNC and Turkey towards computer-assisted education and computers, standard deviation and t-test results are shown in Table 1.

Table 1. Computer-assisted education and arithmetic mean sores of attitudes towards computers, standard deviation values and t-test results

	TRNC		Turkey		t	p
	$\overline{X}$	SS	$\overline{X}$	SS		
Computer-assisted education,						
should be encouraged	4.45	.72	4.37	.77	.85	.70
**makes it difficult for teachers.	4.23	.84	3.98	.82	-2.27	.02
** is a temporary enthusiasm.	4.17	.79	4.17	.56	.09	.93
**is very difficult and complicated.	4.11	.71	4.01	.67	-1.10	.27
improves the quality of education.	4.10	1.05	4.23	.74	-1.05	.30
** causes problems.	3.76	1.05	3.70	.97	-.43	.67
changes the role of teachers in the classroom.	3.14	1.17	3.53	1.07	-2.62	.01*
Total	3.99	.46	4.00	.45	-.08	.93
Computer use in schools						
increases the motivation of students.	4.18	.75	4.10	.61	.86	.39
increases their knowledge and skills.	4.18	.68	4.11	.68	.70	.48
Increases the interest of students towards lessons	4.13	.85	4.16	.70	-.26	.80
**decreases the achievement levels of students.	3.95	.83	3.84	.76	-1.03	.30
**cause them to have difficulties in learning basic concepts.	3.86	.85	3.56	.88	-2.40	.02
**reduces the social relations of students.	2.82	1.17	2.88	1.04	.38	.70
Total	3.46	.40	3.41	.39	1.00	.32
Computers						
are important educational instruments.. They can be useful in every field.	4.18	.79	4.11	.63	.70	.48
are good educational instruments.	4.06	.94	4.16	.55	-.93	.35
**causes more harm than good when used in class	3.95	.82	3.98	.67	.23	.82
**are very complicated for use.	3.93	.88	3.89	.78	-.40	.69
Can be used in every field.	3.81	.96	3.87	.73	-.49	.63
Total	3.99	.61	4.00	.42	-.19	.85
Students						
should understand the significance of computers for the public.	4.40	.64	4.22	.61	2.25	.03
may need to use computers in their lives after school	4.27	.80	4.25	.66	.28	.78
Total	4.34	.66	4.23	.56	1.35	.18
Teachers						
should know how to use computers.	4.33	1.01	4.52	.50	1.58	.12
**in the future, computers will substitute teachers.	4.00	.97	3.82	.99	-1.37	.17
Knowing how to use computer is an important issue for the future of the country	3.89	.93	4.09	.76	-1.79	.07
I prefer to buy a computer instead of encyclopedias for my children.	3.26	1.26	3.13	1.199	.79	.43
**Computers isolate people from one and other.	3.10	1.09	3.05	1.00	.29	.77
If the teachers do not know how to use computers, they can be unemployed in the future.	3.04	1.12	3.01	1.04	.88	.38
Total	3.60	.52	3.61	.42	-.26	.80

*p<0.01 **Reversed items.

The findings showed that all the mean scores of the items related to computer assisted education are over "3.00." As shown in Table 1 the item, "Should be encouraged" has the highest mean score both in the TRNC and Turkey. The item, which has the lowest mean score is "changes the role of teachers in the classroom" both in the TRNC and in Turkey.

Looking at the total values, it can be seen that they have approximate mean scores such as 3.99 in the TRNC and 4.00 in Turkey. According to total values, the perceptions of teachers on computer assisted education in the TRNC and Turkey did not have significant meaningful differences (t=-.08, p=0.93). There are significant differences between the perceptions of teachers in the TRNC and Turkey related to the item "changes the role of teachers in the classroom." (t=-2.62, p=0.01). According to the results, teachers in both countries believe in the idea that computer assisted education affects the role of teacher in the classroom, but on the other hand the teachers in Turkey believe in this idea ($\bar{X}$=3.53) more than the teachers in the TRNC ($\bar{X}$=3.14). It can be interpreted that both teachers in the TRNC and Turkey have positive perspective towards the idea that computer assisted education should be used and this method is not very difficult or complicated in practice. Looking at the items related to effects of computer use on students, the mean scores of all the items except the item "computers reduce the social relation of students" are above 3.00. On the other hand, the items "computers increase motivation" and "computers increase knowledge and skills" have the highest mean scores of 4.18 in the TRNC but in Turkey the highest mean scored item is "increases the interest towards education" in Turkey ($\bar{X}$=4.16). The item which has the lowest mean ($\bar{X}$=2.82, $\bar{X}$=2.88) both in the TRNC and in Turkey is "computers reduce the social relation of students".

The total values show that the mean score is 3.46 in the TRNC and 3.41 in Turkey. No significant meaningful differences (t=1.00, p=0.32) between the perceptions of teachers both in the TRNC and Turkey on the effects of computer use on students were found. According to these results teachers in both countries have common beliefs that computer usage in schools increases student motivation, student interests, student knowledge, student skills and achievement. However computer usage can decrease the social relation of students.

Looking at the items related to computers it can be said that all the mean scores are over 3.00 which means that, both TRNC and Turkish teachers have positive attitudes towards computer use. The item which has the highest mean score is "computers are important educational tools and can be used in every field" ($\bar{X}$=4.18) in the TRNC. The highest mean

score is "computers are good educational instruments" ($\bar{X}$=4.16) in Turkey. But the total scores showed that the mean score is 3.99 in the TRNC and 4.00 in Turkey and no significant differences were found in the perceptions of teachers on computers in both the TRNC and Turkey. (t=-0.19, p=0.85). Therefore, it could be said that teachers in both countries think that computers are important educational tools, they can be used in every lesson and in every field, and their usage is not complicated. The items related student relations with computers, both items in both the TRNC and Turkey have high mean scores. Teachers believe that students should understand the importance of computers in terms of society and think that they may need to use computers in their future lives. No meaningful differences were found in the perceptions of teachers related to these two items (t=-1.35, p=0.18) in both countries. Looking at these findings it can be said that teachers in the TRNC and Turkey agree on the idea that the computer is an important tool for the students.

Looking at the items related to computer use it can be seen that all mean scores in the TRNC and Turkey are over 3.00 .The item "they should know how to use computer" has the highest mean in both the TRNC ($\bar{X}$=4.33) and Turkey ($\bar{X}$=4.52). On the one hand the item "if they do not know how to use computers, they can be unemployed" has the lowest mean in both countries, the TRNC ($\bar{X}$=3.04) and Turkey ($\bar{X}$=3.01). The total values showed that the, mean scores in the TRNC ($\bar{X}$=3.60) and in Turkey ($\bar{X}$=3.61) are close and in high level. There are not meaningful differences (t=-0.26, p=0.80) in the TRNC and Turkey. Teachers in Turkey think that teachers should know how to use computers, and people who do not know how to use computers can be unemployed and believe in the importance of computer use for the future of the country.

In general, as can be seen in Table 1 the responses to all the items in both countries show that teachers have nearly the same ideas about computer assisted education, the effects of computer use in schools on students and all issues related to the computer use of teachers and students.. Except one item, no meaningful differences were found in other items.

Findings Related to the Research Question 2

The arithmetic mean scores, standard deviation values and t-test results related to teachers'' computer use in classrooms in the TRNC and Turkey are presented in Table 2.

Table 2. Arithmetic means, standard deviation values and t-test results related to the aim of computer use in the schools.

	TRNC		TURKEY		t	p
	$\overline{X}$	SS	$\overline{X}$	SS		
For which purpose do you think can computers be used in schools?						
For correspondences (petition, reports, e-mail, etc.)	2.92	.39	2.82	.56	1.60	.11
To prepare exam questions	2.90	.40	2.95	.27	-.98	.33
To prepare materials to be used in my lessons	2.89	.41	3.00	.00	-2.39	.02
To learn how to use computers	2.87	.49	2.81	.57	.85	.40
To prepare lesson plans	2.81	.57	2.91	.41	-1.43	.15
To teach topics	2.70	.67	2.76	.61	-.67	.51
To follow student development	2.70	.69	2.88	.40	-2.30	.02
To calculate student grades	2.39	.910	2.82	.58	-3.93	.00*
For special purposes outside the school	2.30	.92	2.15	.87	.07	.95
To make experiments in science laboratories	2.15	.87	2.41	.80	-.23	.02

*p<0.01

According to Table 2 teachers in the TRNC use computers in schools mostly for writing letters ($\overline{X}$=2.92), to prepare exam questions ($\overline{X}$=2.90) and to prepare course materials that they would use ($\overline{X}$=2.89). The lowest scores in the TRNC were obtained for the purposes related to carrying out experiments in science laboratories ($\overline{X}$=2.15), using computers outside the school ($\overline{X}$=2.30) and calculating students grades ($\overline{X}$=2.39). But in Turkey teachers use computers mostly for preparing course materials ($\overline{X}$=3.00), preparing exam questions ($\overline{X}$=2.95) and preparing lesson plans ($\overline{X}$=2.91). These teachers do not use computers much for special purposes outside the school, doing experiments in science laboratories and teaching topics. In that context, the aims of teachers that are using computers in the schools of both countries are the same. Looking at the mean differences between the usage aims of computers, it can be seen that only the item "to calculate student grades" was found to have a meaningful difference (t=-3.93 p=0.00). From these results, it can be concluded that teachers in Turkey use computers for calculating student grades more than the teachers in TRNC do.

Findings Related to the Research Question 3

The arithmetic mean, standard deviation values and t-test results related to the need of the TRNC and Turkish teachers for computers and computer materials in schools are shown in Table 3.

Table 3. The arithmetic mean, standard deviation values and t-test results related to the need of computer and computer materials in schools.

	TRNC		TURKEY		t	p
	$\overline{X}$	SS	$\overline{X}$	SS		
Evaluate the following items according to prior needs of your school						
Over-head projector to reflect the images on the computer	4.17	.94	4.31	.64	-1.39	.17
Software which can be used for educational purposes	4.14	.70	4.17	.57	-.31	.75
Computer training which can be offered to our teachers	4.11	.95	4.16	.65	-.49	.63
Personal training in computer use	4.06	.91	4.28	.61	-2.25	.03
Computer laboratories , which is opened to public	4.02	1.04	4.16	.72	-1.18	.24
Private network connection to increase the communication between schools	3.99	.91	4.13	.63	-1.47	.14
Software which can be used for administrative purposes	3.92	.87	4.06	.61	-1.52	.13
At least one computer for every classroom	3.88	1.05	4.28	.64	-3.23	.00*
Technical support staff which will available all the time	3.81	1.18	4.22	.58	-2.99	.00*
The opportunity of accessing the internet form each class	3.40	1.16	4.11	.82	-5.00	.00*
One computer for each teacher	3.18	1.17	3.98	.94	-5.45	.00*
One computer for each student in the classroom	2.99	1.21	3.40	1.12	-2.58	.01*

*p<0.01

Table 3 shows that the items that the teachers in the TRNC need the most are an over-head projector ($\overline{X}$=4.17) to reflect the images on computers, and software to be used for educational purposes ($\overline{X}$=4.14). But in Turkey it can be seen that the items that the teachers need are an overhead projector, which reflects computer images, staff who received education on computers, and minimum of one computer in each classroom. Significant differences were found between the following needs of teachers in two countries:. "At least one computer for each class" (t=-3.23, p=0.00), "Technical support staff which will be available all the time" (t=-2.99, p=0.00), "The opportunity of having access the internet in each class "(t=-5.00 p=0.00), "One computer for each teacher" (t=-5.45, p=0.00) and "One computer for each student in the classroom" (t=-2.58, p=0.01). This finding shows that teachers in Turkey need the items of supplying computers to every teacher, at least one computer for every classroom, computers for every student, accession to the internet in the class and a technical support staff who is available most of the time in school more than

teachers in the the TRNC. According to these results, there is a great need for computers and computer materials both in the TRNC and Turkey, but more in Turkey.

Findings Related to the Research Question 4

The arithmetic mean, standard deviation values and t-test results related to computer use of teachers in the TRNC and Turkey are shown in Table 4.

Table 4. The arithmetic mean standard deviation values and t-test results related to computer use

	TRNC		TURKEY		t	p
	$\overline{X}$	SS	$\overline{X}$	SS		
Have you ever used computers?	1.92	.28	1.99	.08	2.50	.01*

*p<0.01

According to Table 4, the mean scores of prior experiences with computer use related to teachers in both countries are 1.92 in the TRNC and 1.99 in Turkey. When we looked at the differences in teachers' prior experiences with computer use in the TRNC and Turkey, we found meaningful differences: (t=2.50, p=0.01). The findings showed that teachers in Turkey who have used computers before, are more than the teachers in the TRNC.

Findings Related to the Research Question 5

The arithmetic mean, standard deviation values and t-test results related to computer use periods of teachers in the TRNC and Turkey are shown in Table 5.

Table 5. The arithmetic mean standard deviation values and t-test results related to computer use period.

	TRNC		TURKEY		t	p
	$\overline{X}$	SS	$\overline{X}$	SS		
How long have you used computers till now?	3.58	.76	3.10	1.19	3.92	.00*

*p<0.01

According to table 5, the mean scores of computer use periods of teachers in both countries are 3.58 in the TRNC and 3.10 in Turkey. Meaningful differences were found in teachers' computer use period in both countries at significant level (t=3.92, p=0.00). It can be concluded that teachers in the TRNC use computers more than teachers in Turkey in terms of computer use period.

Findings Related to the Research Question 6

The arithmetic mean, standard deviation values and t-test results related to training computer use of teachers in the TRNC and Turkey are shown in Table 6.

Table 6. The arithmetic mean standard deviation values and t-test results related to training computer use

	TRNC		TURKEY		t	P
	$\overline{X}$	SS	$\overline{X}$	SS		
I learned using computer						
On my own	1.68	.47	1.65	.48	-.44	.66
By having in-service training in my institution	1.62	.49	1.58	.49	-.53	.60
By attending a special course	1.49	.50	1.32	.47	-2.57	.01*
From my friends	1.49	.50	1.45	.50	-.54	.59
In my school years	1.27	.45	1.33	.47	.83	.41

*p<0.01

The Table 6 shows that both teachers in Turkey ($\overline{X}$=1.65) and in the TRNC ($\overline{X}$=1.68) learnt how to use computer on their own. Both teachers in Turkey ($\overline{X}$=1.58) and TRNC ($\overline{X}$=1.62) have learnt how to use computer by taking pre-service courses in their institutions is listed as the second highest mean score. It is stated that teachers in the TRNC learnt how to use computers in their school years ($\overline{X}$=1.27) and teachers in Turkey learnt how to use computers by attending special courses ($\overline{X}$=1.32). To find if there is a significant difference between the teachers in both countries related to the issue of where they have learnt how to use computers, a meaningful difference was found only for the item "by attending special courses" (t=-2.57, p=0.01). It can be argued that teachers in the TRNC have attended more special courses on computers than the teachers in Turkey. In general it was found that there was a parallelism between the scores related to where the teachers have learnt how to use computers in both countries.

Findings Related to the Research Question 7

The arithmetic mean, standard deviation values and t-test results related to in-service teachers training periods of both the TRNC and Turkey about the issue of computer use by teachers in the TRNC and Turkey are shown in Table 7.

Table 7. The arithmetic mean standard deviation values and t-test results related to training computer use

	TRNC		TURKEY		t	p
	$\overline{X}$	SS	$\overline{X}$	SS		
Have you ever taken in-service training on computers?	2.10	1.37	2.80	1.32	-3.94	.00*
Did you improve yourself after training period?	2.48	1.60	2.59	1.11	-.59	.56
Do you believe that you should take training courses again?	2.45	1.65	2.27	1.60	.84	.40
Did you have the opportunity of using the knowledge you received during the training period?	2.35	1.51	1.16	.45	7.06	.00*
Did the training course match your expectation?	2.29	1.43	1.92	.41	2.29	.02
Were the course subjects offered during the training parallel with your school practices?	2.21	1.41	1.10	.30	7.16	.00*
Were the educational practices, educational documents and given samples related to your field?	2.20	1.49	2.81	1.41	-3.17	.00*
Did you have any chance to practice during your training?	2.10	1.37	2.80	1.32	-3.94	.00*
Was enough time allocated to the given subjects during the training?	1.92	1.24	3.36	1.50	-8.08	.00*

*p<0.01

The table 7 shows that both item mean scores related to in-service training on computer use in the TRNC and Turkey are below the mean score 3.00, except for only one item. The item which has the highest mean score in the TRNC is "Did you improve yourself after your training period?" ($\overline{X}$=2.48), whereas the item which has the highest mean score in Turkey is "Was enough time allocated to the given subjects during your training?" ($\overline{X}$=3.36). The item, "Was enough time allocated to the given subjects during your training?" has the lowest mean score in the TRNC (x=1.92), whereas in Turkey the item which has the lowest mean score is "Were the course subjects offered during the training parallel with your school practices?" ($\overline{X}$=1.10).

Meaningful differences were found in 6 items related to in-service training on computer use in both countries. It was found that teachers in the TRNC received lesser in-service training and have used their knowledge that they obtained during in-service training in their future lives more than those of Turkey. Teachers have also stated that their taught subjects are parallel with their school practices. On the other hand, teachers in Turkey stated that the in-service training courses, educational materials and the samples were related to their field. They had the chance to practice throughout their training and sufficient time was allocated for the subjects taught during the training. Although there are differences between the teachers' perceptions on in-service training on computer use it

can still be said that teachers in both countries have common views on in-service training. Teachers in general do not find the in-service training on computer use sufficient and appropriate for their aims.

Findings Related to the Research Question 8

The arithmetic mean, standard deviation values and t-test results related to teachers' perceptions on computers and computer use in the TRNC and Turkey are presented in Table 8.

Table 8. The arithmetic mean standard deviation values and t-test results related to training computer use

	TRNC		TURKEY		t	p
	$\overline{X}$	SS	$\overline{X}$	SS		
Are there computers for the use of teachers?	1.10	.31	1.71	.45	-12.49	.00*
Approximately how many computers are there in your school?	1.48	.50	2.91	.45	-17.30	.00*
How often do you use computers in your school?	2.95	1.54	3.85	.63	-4.75	.00*

*p<0.01

According to Table 8, the item "Are there any computers for the use of teachers?" has the mean score of 1.10 in the TRNC and 1.71 in Turkey. The item "Approximately how many computers are there in the schools?" has the mean score of 1.48 in the TRNC, whereas this score is 2.91 in Turkey. The mean scores of the answers given to the question, "How often do you use the computers in your schools?" are 2.95 in the TRNC 3.85 in Turkey respectively. Meaningful differences were found in these 3 items. The findings showed that teachers in Turkey had more computers in their schools than those in the TRNC. On the other hand teachers in Turkey stated that they had more than 50 computers in their schools, but teachers in the TRNC had less than 10 computers in their schools. The findings showed that teachers in Turkey used computers a few times a week, whereas teachers in the TRNC used computers only a few times in a month. According to these results, it can be interpreted that schools in the TRNC had less computers compared to schools in Turkey and teachers in the TRNC had insufficient opportunities of using computers.

Discussion and Conclusion

According to the research findings, teachers in both countries had positive attitudes toward computer based instruction in schools. They certainly believed in employing computer-based instruction in schools. Besides they claimed that such an instruction is not difficult and complicated.

Although there are several studies in the literature confirming that male or female have more positive opinions related to computers and their usage in schools, this study's findings are parallel to a study by Saracaloğlu, O. Serin, Bulut-Serin & U. Serin (2010) who found that there is no significant finding regarding the gender variable.

Findings in this study are also parallel to the results of Cüre and Özdener's (2008) study which also found that teachers had positive ideas about computers even though they had certain inadequacies. Çağıltay, Çakıroğlu, Çağıltay and Çakıroğlu's (2001) study revealed the need for instructional use of computers in schools. Teachers in both countries believed that computers were crucial educational instruments to be used in every lesson and their use is not so complicated. They also claimed that computers were important instruments for all students. Students should have recognized the importance of computers in the society, and computers were also needed in their lives after school. All teachers in both countries also believed that teachers should have known how to use computers; knowing how to use computers effectively is important for the country and if people did not have the necessary skills in using computers they could not be unemployed in the future. Teachers in both countries have similar perceptions on the issue related to computer-based education, effects of computer use in schools on students, computers and how teachers and students used computers. There was no significant difference in the responses of the teachers in both countries except their responses to one item.

Teachers in the TRNC used computers for correspondence purposes, preparing test questions and course materials respectively. They used computers least frequently for experiments in science laboratories and calculating the student grades. Teachers in Turkey mostly use computers in preparing course materials, course plan and exams. They do not

use computers in extracurricular (out-of-school) activities, science experiments and for teaching purposes. In that sense, it can be stated that Turkish and Turkish Cypriot teachers use computers with similar purposes. This is similar to results of some studies carried out in Turkish schools that computers are generally used for instructional purposes such as preparing course materials, and test questions and their distribution (Aşkar & Usluel, 2003; Aypay & Özbaşı, 2008; Çelik & Bindak, 2005; Yıldırım, 2007). The results of some studies (Çelik & Bindak, 2005; Erkan, 2004) also confirm that there is a positive relationship between the frequency of computer use and attitude towards computers.

In order to understand whether there is a difference in teachers' purposes related to use of computers, difference was found only in "calculating student grades", in favour of Turkish teachers ($p>0.01$). Besides, the findings of a qualitative study performed by Balkı and Şaban (2009) showed that teachers also tend to use computers with instructional purposes, as well as additional purposes, when they are provided the necessary conditions. Although Aşkar and Usluel's (2002) study does not directly inform about this topic, they found that the computers are used more for administrative (correspondences, official contacts… etc.) purposes in comparison to instructional purposes and teachers have some doubts in using computers for teaching purposes. Although teachers tend to accept the idea that computers can be widely used for instructional purposes in many studies, Russell, Bebell, O'Dwyer and O'Connor's (2003) study confirms that the use of computers by teachers for instructional purposes in classrooms are limited.

The related literature indicates that the use of computers and technology in schools depends more on instructional philosophy (traditional-progressive) that the school employs. It is a fact that progressive approaches support and encourage the use of computers as well as authentic materials in classrooms for effective student learning. For example, Becker and Ravit's (2001) and Yavuz and Coşkun's (2008) studies confirm that the use of computers and technology are commonly observed in learner centered settings and the attitudes towards computers and technology is quite positive in these schools which are based on learner-centered philosophies. Within this framework, Ertmer, Ross and Gopalakrishnan's (2000) studies also reveal that the use of technology and computers

in learner-centered school settings is strongly tied with internal reward or motivation systems supported by teachers.

Related to the technology and computer needs in both countries, the TRNC schools need projectors (to reflect the course materials on the wall or curtain), instructional software for the courses, and in-service training for the teachers related to computer literacy respectively. Turkish schools also need projectors (to reflect the course materials on the wall or curtain), staff members who have computer literacy and personal computers in every class. The findings show that the need for allocating personal computers to all teachers, having at least one computer and internet connection in every classroom, and a continuously employed computer technician in every school is needed more in Turkish schools than the TRNC schools. The schools in both countries need more computers and technological materials; however the need is stated a little more by Turkish teachers. This finding is supported by the study administered by Balkı ve Şaban (2009) that shows that there is a lack of technical equipment and support, technological tools and materials in Turkish schools.

According to the findings of the study, there is a significant difference between the perceptions of the teachers in Turkey and the TRNC regarding experience in use of computers, in favor of Turkish teachers. The number and percentage of teachers having experience about the usage of computers are more in Turkish schools compared to the TRNC schools. However, the teachers in the the TRNC schools use computers longer than those in Turkish schools. The literature (Aral, Ayhan, Ünlü, Erdoğan & Ünal, 2007; Çelik & Bindak, 2005) suggests that teachers who previously used computers have more positive attitudes towards computers and technology than those who do not. In that sense, it can be suggested that the use of computers, especially with instructional purposes, should be encouraged, supported and taught in schools.

The findings show that the teachers in both countries learned to use computers mostly by themselves, and through in-service training programs. Turkish Cypriot and Turkish teachers learned to use computers while they were undergraduate students and attended private courses to learn how to use computers. This shows that the ways of learning how

to use computers for most of the teachers in both countries are similar. This finding also suggests that undergraduate level teacher training programs in both countries should focus more on technology based sessions or courses.

Regarding the in-service training of the teachers related to computers and technology, the findings indicate that the teachers in the TRNC schools use the knowledge they gained in in-service training more than Turkish teachers. Besides the topics covered during the in-service sessions are more appropriate for practical implementations in the schools than those in Turkish cases. Turkish teachers also confirm that in-service training somewhat helps them in instructional documents; given examples and practices in training sessions and the length of the training are appropriate. Although slight differences are observed, teachers in both countries have generally similar perceptions on in-service training on computers and technology use. Generally speaking, the teachers perceive in-service training programs ineffective and inappropriate to the goals and objectives of the topic. Yıldırım's (1999) study confirms these findings. In his study teachers think that in-service training on how to use computers in schools is unsatisfactory. Extending this finding, Usluel, Mumcu and Demiraslan (2007) conducted a study with teachers and found that the major reasons of teachers' deficiencies of computer literacy are unsatisfactory technology and computer infrastructure in schools, and inadequacy of teachers in using computers. This finding also shows that providing in-service training on managing computers and technology in schools does not mean that in-service training is always effective.

According to the research findings, Turkish teachers claimed that they have more computers to use, than schools in the TRNC. While the Turkish Cypriot teachers claimed that they have less than 10 computers in their schools, fifty percent of the teachers in schools of Turkey state that they have more than 50 computers in their schools. Turkish teachers use computers a few times a week, but Turkish Cypriot teachers find chance to use computers in schools a few times a month.

As stated earlier, this research study shows that teachers generally have positive attitudes towards using computers and technology in schools. This finding requires administrators and decision makers in educational policies to take actions that teachers who are the major

actors in raising new generations in the society should be provided facilities with practical learning environments that are crucial for information and communication age. As parallel to this, Göktaş, Yıldırım ve Yıldırım's (2008) study concludes that teacher training institutions should recognize the importance of information technologies and computers by establishing necessary physical and instructional infrastructure that may create an effective learning atmosphere in schools. Regarding pre-service education, Aypay and Özbaşı (2008) and Saracaloğlu, O. Serin, Bulut-Serin & U. Serin (2010) also observed that there is a significant difference between candidate teacher's attitude scores and their state of using computers before in favour of experienced ones.

As a conclusion, this research was conducted with teachers in two countries which are thought to have similar characteristics. This research might be extended to different parts and cities of these countries since only two cities were included in this study. Similar research studies may be done with different stakeholders (administrators, teacher trainers, parents, students) other than teachers, with different and in-depth research methodologies and techniques such as qualitative ones. The number of computers and computer aided instruction should be increased in schools. Technical support and in-service training may be helpful to remove the inadequacies of teachers related to applying such instruction in classrooms.

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