INVESTIGATING THE INSTRUCTORS' ATTITUDES TOWARDS THE USE OF INFORMATION AND COMMUNICATION TECHNOLOGIES (ICT) IN HIGHER EDUCATION

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Thesis Abstract

Osman Akşit, "Investigating the instructors' attitudes towards the use of information and communication technologies (ICT) in higher education"

The aim of this study is to investigate the instructors' attitudes towards the use of ICT in education and to explore differences in the attitudes between instructors who are grouped according to six demographic variables: age, gender, academic rank, academic discipline, years of teaching experience and location of current occupation. After an extensive review of literature, a web-based online questionnaire was prepared. The questionnaire was sent to 5646 people via e-mail. 302 instructors from twenty one different universities across Turkey have responded to the questionnaire. The response rate to the survey is 5.35%. The responses to the survey were analyzed by using IBM SPSS Statistics version 21 for Windows; reliabilities were tested by Cronbach's Alpha analysis. Independent sample t-test and one-way ANOVA were applied to determine the differences in the attitudes towards the use of ICT in education between instructors who are grouped according to six demographic variables. The findings indicate that the instructors' attitudes towards the use of ICT in education are positive. The findings also show that there is no statistically significant difference between instructors with different demographic characteristics of age, gender, academic rank and location of current occupation in terms of their attitudes towards the use of ICT in education. However, the findings show that there is a statistically significant difference in the attitudes towards ICT between instructors with different years of teaching experience. Limitations and suggestions for future research have been discussed at the end the study.

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Tez Özeti

Osman Akşit, "Yüksek öğretimdeki öğretim elemanlarının bilgi ve iletişim teknolojilerini (BİT) eğitimde kullanmalarına yönelik tutumlarının araştırılması" Bu çalışmanın amacı yüksek öğretimdeki öğretim elemanlarının eğitimde BİT kullanmaya yönelik tutumlarını arastırmak ve yaş, cinsiyet, akademik pozisyon, akademik disiplin, eğitim yılı tecrübesi ve şu anki çalışma yerinin konumu olarak altı demografik değişkene göre gruplandırılmış öğretim elemanlarının tutumları arasındaki farklılıkları incelemektir. Kapsamlı bir literatür taraması yapıldıktan sonra çevrimiçi web tabanlı bir anket hazırlanmıştır. Anket 5646 kişiye e-posta yoluyla gönderilmiştir. Türkiye genelinde yirmi bir farklı üniversiteden 302 öğretim elemanı ankete yanıt vermiştir. Araştırmaya geri dönüş oranı %5.35'dür. Bu çalışmaya verilen cevaplar IBM SPSS Statistics version 21 for Windows yazılımı kullanılarak analiz edilmiş ve tutum ölçeğinin güveninirliği Cronbach's Alpha testi ile kontrol edilmiştir. Altı demografik değişkene göre gruplandırılan öğretim elemanlarının BİT kullanım tutumları arasındaki farklılıkları saptamak için Bağımsız Örneklem t-test ve Tek Yönlü Varyans Analizi testleri uygulanmıştır. Bulgular öğretim elemanlarının eğitimde BİT kullanmaya yönelik tutumlarının olumlu olduğunu göstermektedir. Bulgular aynı zamanda yaş, cinsiyet, akademik pozisyon ve şu anki çalışma yerinin konumu gibi farklı demografik özelliklere sahip öğretim elemanlarının eğitimde BİT kullanmaya yönelik tutumları arasında istatistiksel önemde bir farklılık olmadığını göstermektedir. Ancak bulgular farklı eğitim yılı tecrübesine sahip öğretim elemanlarının eğitimde BİT kullanmaya yönelik tutumları arasında istatistiksel önemde bir farklılık olduğunu göstermektedir. Kısıtlamalar ve gelecek araştırmalar için öneriler çalışmanın sonunda tartışılmıştır.

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CHAPTER 1

INTRODUCTION

We live in a time of rapid technological change. The birth of the personal computers in 1970s, the rise of graphical user interfaces and World Wide Web in the 1990s have started the global transformation of information age. Accessing, retrieving and using relevant information has become an essential skill today. Information and communication technologies (ICT) have made it very easy to access the information and have become an indispensible tool for most of the people in the developed world (International Telecommunications Union, 2013). It has changed how we live and how we communicate. Social media has become a new trend and thanks to smart phones we can use the internet at anytime and anywhere. In the light of these rapid technological developments, educational institutions are expected to teach their students how to use information and communication technologies effectively in their personal and professional lives. To achieve this goal and to exploit the advantages of using ICT tools in teaching and learning, there have been numerous efforts to increase the presence of technology in educational institutions.

In the past ten years, an increasing number of developed and developing countries including Turkey have made substantial investments to integrate ICT into education (Tondeur, van Braak & Valcke, 2007). For instance, Turkey has launched Project Fatih to integrate ICT into high schools across the country in 2011. It is one of the most significant educational investments in Turkey. With this project, 42,000 schools across the country and 570,000 classes in those schools will be equipped with the latest ICT tools and will be turned into computerized education classes in 2014 (Turkish Ministry Of Education, 2012). However, these investments do not

always guarantee the successful integration of ICT into teaching and learning. Simply buying and putting all the necessary technological tools into classroom is not enough to exploit the advantages of these tools in the classroom. Although these ICT investments have significant potential for educational innovation, most of the time the role of the teachers are either underestimated or completely omitted because of the immensity of the task (Vacc & Bright, 1999; Cuban, 2000; Niederhauser & Stoddart, 2001).

According to the general belief, if the appropriate ICT tools are available to the instructors and students in the classroom, the integration of ICT into education will follow accordingly. However, it should not be forgotten that they are the teachers who use these ICT tools in the classroom along with the students as a part of the curriculum. Teachers' attitudes towards the use of ICT in education must be taken into account before the investment and integration of these tools has been made because many studies (Lawton & Gerschner, 1982; Richardson, 1996; Kluever, Lam & Hoffman, 1994; Yıldırım, 2000; Cuban, 2000; Kellenberger & Hendricks, 2003; Usun, 2004; Liaw, Huang & Chen, 2007) show that the successful integration of ICT tools into classrooms depends on the teachers' attitudes towards ICT. In addition, teachers' attitudes and abilities to use technology in education also differ widely (Sutherland-Smith, 2002). So examining teachers' attitudes towards the use of ICT tools in education plays a critical role when there is an ongoing plan to invest in technology in any educational institute.

This study aims to investigate the instructors' attitudes towards the use of ICT in higher education and to explore the differences in attitudes towards ICT between instructors with different personal characteristics such as age, gender, academic rank, academic discipline, years of teaching experience and location of current occupation.

I have chosen to study instructors in higher education because there are similar studies that have been carried out with elementary and secondary level teachers in Turkey (Altun, 2003; Asan, 2003; Bayhan, Olgun & Yelland, 2002; Gömleksiz, 2004; Deniz, 2005; Çavaş, Karaoğlan, Çavaş & Kışla, 2009; Ocak & Akdemir, 2008; Tezci, 2010; Cüre & Özdener, 2008) but I could not find any study that investigates the attitudes of university instructors towards the use of ICT tools in Turkish higher educational institutions. Having established the importance of teachers' attitudes towards ICT is important at any educational level, it follows that investigating university instructors' attitudes towards ICT is necessary.

The data collection method used for this study was a survey which was designed to seek inputs from instructors in higher educational institutions of Turkey. A web-based online research questionnaire was prepared and "Google Forms" was used for distributing the questionnaire electronically and collecting data. Three universities were selected randomly from each geographic area of Turkey and in total twenty one universities were included in the study. Instructors' e-mail addresses from the selected universities were collected from university web sites. E-mails which included a brief statement for the rationale of the study and a web link to the questionnaire were sent to the instructors. 302 respondents from various academic disciplines and different years of teaching experience responded to the questionnaire. Independent sample t-test and one-way ANOVA were applied to the survey data in order to explore the differences in the attitudes towards ICT between instructors who are grouped according to the six demographic variables.

This thesis proceeds with Chapter 2 which includes literature review for the attitude of teachers towards the use of ICT in education. In Chapter 3, the purpose of the study has been stated. Chapter 4 presents the methodology. Chapter 5 shows the analyses and findings. Finally Chapter 6 contains the summary of findings, conclusion, limitations of the study and suggestions for future research.

CHAPTER 2

LITERATURE REVIEW

We are living in the information age today and technology is advancing and evolving at an incredible rate which was not observed before in the history of human kind. Developments and widespread use of new information and communication technologies (ICT) over the past two decades have made some significant changes the way people live, communicate and interact with each other. Unprecedented growth of internet, decreasing costs of computers and mobile technology along with the proliferation and prevalence of ICT-based applications in public and private sector make society increasingly dependent on technology. Today technological gadgets have become ubiquitous, cheaper and accessible than ever. Personal computers and smart phones are now accepted as personal necessities. It can be said that information and communication technology tools have become irreplaceable entities in nearly all aspects of our lives. ICT is clearly influencing all fields of our lives and education is not an exception.

ICT is a generic term that refers to various kinds of technologies such as computers, internet, smart phones, videos, associated hardware, software and networks which are being used to collect, store, edit and exchange information in various forms. Toomey (2001) defines ICT as "it generally relates to those technologies that are used for accessing, gathering, manipulating and presenting or communicating information. The technologies could include hardware (e.g. computers and other electronic devices); software applications; and connectivity (e.g. access to internet, local networking infrastructure, videoconferencing). " (cited in Lloyd, 2005)

At this age of rapid technological developments, developed and developing countries around the world have realized the opportunities to invest in the technology for their education systems. Many countries like USA, Denmark, Japan, Finland, Netherlands, Portugal and Spain have prepared strategic master plans for integrating ICT into education (Cheng, 2002). For example, the UK government gave a high priority to the integration of information technology into the classrooms by making substantial investments in ICT for schools to make technology an integral part of teaching and learning process (Haydn & Barton, 2007). The Hong Kong government has been working hard to improve and increase the quality of its primary and secondary schools by spending HK\$5 billion into a five-year IT strategic plan which includes providing all schools with broadband internet connection, networked computers, basic and intermediate IT training for teachers and a solid IT infrastructure (So & Swatman, 2006).

In Turkey, this trend of investing heavily in ICT for educational institutions is no different than other developed and developing countries. The investments of ICT to the public institutions by central government are being monitored closely since 2002 by Turkish Ministry of Development (TMD). Every year, TMD publishes yearly statistics of ICT investments to public institutions by central government. According to the statistics published for 2013 (TMD - Information Society Department, 2013), ICT investments to public institutions have been steadily increased since 2002 and it became 3586 million TL in 2013 which can be seen in Figure 1.



Figure 1. Public ICT Investments between 2002-2013 (TMD, 2013)

As shown in Figure 1, Turkish central government has been investing in ICT by spending considerable amount of money to public institutions every year and the public education sector constitutes nearly half of the share for the last three years. Figure 2 (TMD, 2011), Figure 3 (TMD, 2012) and Figure 4 (TMD, 2013) show the ICT investments as per sector for the respective years.



Figure 2. Public ICT Investments as per Sector - 2011 (TMD, 2011)



Figure 3. Public ICT Investments as per Sector - 2012 (TMD, 2012)



Figure 4. Public ICT Investments as per Sector - 2013 (TMD, 2013)

It is clear that Turkish Government has been giving a higher importance to ICT investments for educational institutions like other developed and developing countries around the world. Although the decision makers are generally keen on investing in ICT, most of the time they assume that if the invested educational technologies are present in the classroom, the successful integration of ICT into teaching and learning activities will automatically be achieved. However, according to Harrison et al. (2002), although the presence of ICT across educational institutions has been established, the integration into the teaching and learning process has been slow. To understand whether the Turkish education institutions can take the maximum advantage of these investments, it is crucially important to know if the Turkish teachers are ready and prepared to use new ICT tools and pedagogical approaches in their teaching and learning activities in the classroom.

A significant body of literature shows that the successful integration of ICT into everyday classroom activities can increase students' motivation, promote active and collaborative learning, enhance teaching and offer better access to information if it is used under the right conditions (Jonassen, 1994; Eurydice, 2001; Pelgrum, 2001; Webb, 2005; Leach, Ahmed, Makalima & Power, 2005). However, teaching with technology is entirely different than teaching within a typical traditional classroom environment. Teachers must be trained in how to plan, create and deliver instruction within a technological setting by integrating ICT tools into their teaching activities which requires a completely different pedagogical approach.

According to Tondeur et al. (2007), there are two main categories of ICT use in education: supportive ICT use and classroom ICT use. 'Supportive ICT use' involves administrative activities and pro-active teaching tasks such as preparing worksheets, keeping track of students' learning progress and so on. On the other hand, 'classroom ICT use' aims to support and enhance the actual teaching and learning processes such as using computers to show an interactive PowerPoint presentation in the classroom.

A large amount of investments were made to integrate ICT into teaching and learning without taking the teachers' attitudes towards the use of these tools into

account (Cohen & Ball, 1990; Vacc & Bright, 1999; Niederhauser & Stoddart, 2001). If the attitudes of the instructors towards the use of ICT in teaching become more positive, his/her intention to use it effectively increases (Liaw et al., 2007). Many other studies also showed that the teachers' attitudes towards the use of computers strongly affect their initial acceptance of computer technology and their future behaviors about integrating computer technology into their teaching practices (Koohang, 1989; Violato, Mariniz & Hunter, 1989; Kluever et al., 1994; Lawton et al., 1982; Williams, Wilson, Richardson & Tuson, 2000; Potosky & Bobko, 2001; Galanouli, Murphy & Gardner, 2004).

The potential benefits of integrating ICT into educational context cannot be limited to teaching practices of teachers and learning activities of students in higher education. Information and communication tools can also be a valuable resource for academic and scientific research conducted by teachers and students in higher education institutions (Zaree, 2011). Scientific article databases, data anaylsis software, blogs and wikis can significantly help teachers and students through all stages of a research process from doing a literature review to share findings with other researchers around the world.

Although the investments are being made in terms of buying new technology tools and equipments to assist learning and teaching activities of teachers in the classrooms in higher education institutions, there are still some university faculty members who are cautious to integrate ICT into their teaching practices (Yaacob, Fariza & Azman, 2005; Barak, 2006). Furthermore, many research findings also suggest that information and communication technologies are significantly underused by students and teachers around the world (Brayd, 1995; Dearing, 1997; Murphy & Greenword, 1998; Kayode, 2006; So & Swatman, 2006). There are

several reasons for university faculty members not to use technology in their teaching practices. Some of these reasons can be environmental while others can be personal (Abdelraheem, 2004). Environmental factors can be managed and solved but personal factors are not easy to deal with. Environmental factors may include access to hardware and software (Hong & Koh, 2002; Drent & Meelissen, 2008), technical support (Fullan, 1991) and administrative support (Czerniak, Lumpe, Haney & Beck, 1999). On the other hand, personal factors may include individual characteristics such as age, gender and years of teaching experience (Durndell & Thomson, 1997; Luchetta, 2000; Jennings & Onwuegbuzie, 2001; Hartley & Bendixen, 2001; Adams, 2002; Aydın, 2007), self-efficacy (Karsten & Roth, 1998; Torkzadeh, Chang & Demirhan, 2006; Paraskeva, Bouta & Papagianni, 2008), beliefs (Lim & Chan, 2007; Teo, Chai, Hung & Lee, 2008a; Chen, 2008), experience of ICT use and training (Paraskeva et al., 2008; Çelik & Bindak, 2005; Anderson, 2006; Kayode, 2006), learning and teaching approach (Niederhauser & Stoddart, 2001; Teo et al., 2008).

CHAPTER 3

THE PURPOSE OF THE STUDY

The human factor is one of the major factors which determine the successful implementation of the ICT investments to educational institutions and the teachers are the key human actors in this scene. Their subjective views and attitudes towards the use of ICT in their teaching practices and the factors which affect their views and attitudes are worth investigating for the successful integration of technology into teaching and learning activities.

Although the literature includes many studies regarding Turkish teachers' attitudes towards ICT and the factors that affect their attitudes, these studies mostly focused on the primary and secondary level teachers. There is a need for more studies that focus on the teachers at higher educational institutions.

Based on the idea that teachers' attitudes towards ICT and their personal characteristics are related, this study aims to investigate the instructors' attitudes in Turkish higher educational institutions towards the use of ICT in their teaching practices and also to explore the differences in attitudes between instructors who are grouped according to the six demographic variables: age, gender, academic rank, academic discipline, years of teaching experience and location of current occupation in terms of geographic area.

CHAPTER 4

METHODOLOGY

In this chapter, the methodology of the study will be presented. Initially, the overall design of the study will be illustrated, and then the research questionnaire prepared for the survey will be explained in detail. Three parts of the questionnaire will be described; the questions and statements in each part will be also discussed in this section. Finally, the participants of the survey will be illustrated in the last section. Application of the research questionnaire and data collection procedures will be also explained fully in the last section.

Research Design

This study employed a descriptive survey method by using a web-based questionnaire. Based on the idea that web-based surveys can effectively and efficiently reach widely distributed respondents, a web-based research questionnaire was designed and developed. A web-based survey enabled us to be able to reach instructors from twenty one different universities in seven geographic areas of Turkey. The questionnaire consists of three parts. The first part deals with collecting demographic data of the participants, second part gathers data regarding the technical experience and skills of the respondents. The final part of the questionnaire is based on the STATICTE instrument (Çavaş et al., 2009). The final part aims to find the attitudes of teachers towards the use of ICT in their teaching practices.

Instrumentation

A web-based online research questionnaire was prepared to collect the data in this study. Instead of using traditional postal mail paper-based survey method, a webbased electronic mail survey method was preferred for a number of reasons. Compared with traditional surveys, web-based surveys are quicker, more efficient and less expensive (Çobanoğlu, 2001; Roztocki, 2001; Fleming & Bowden, 2009). Web-based surveys can be prepared and ready in a matter of days, data from an online questionnaire can be collected continuously regardless of time of a day or day of a week without any geographical limitation (Madge, 2006; Fleming & Bowden, 2009). Web-based surveys are becoming increasingly popular today and there are more and more organizations and individuals using the internet to distribute the questionnaire and collect the data from a large number of geographically dispersed respondents (Lazar & Preece, 1999; Su, Shao & Fang, 2008). As for the quality and validity of the data of web-based surveys compared to traditional paper and pencil version, there are no big differences of the quality and validity of the data in the literature. Mertler (2003) conducted two forms of an identical survey: one was traditional paper-based and the other was web-based. He compared the findings of the two identical surveys. Although he found the rates of response were quite different, the respective measures of reliability were extremely similar for the two versions of the survey. In addition, a study by Stanton (1998) comparing web-based and paper-based versions of a survey found fewer missing data in the web survey and no differences in variability, factor structure or measurement error. So it can be said that a web-based approach is a viable tool for gathering survey data.

'Google Forms' (https://drive.google.com), a completely free online survey making application of Google, was used to prepare the questionnaire and distribute it to a large group of geographically dispersed people. There are other online popular survey making tools on the market such as SurveyMonkey, Zoomerang and SurveyGizmo however Google Forms is the only professional tool which is completely free for the time being. It was possible to use the free versions of the other services mentioned but the feature set limits the number of questions in a survey and the number of responses per survey. For instance, in the basic free version of SurveyMonkey, only ten questions are allowed to put in a survey and at most one hundred responses are accepted per survey (SurveyMonkey Plans and Pricing, 2013). The other tools are also similar in pricing to SurveyMonkey.

The survey of this study was designed to be anonymous and Google Forms keeps the anonymity of the responses by not collecting the IP addresses of the respondents which can later be used to trace the real identity. Google Forms only keeps the information the respondent actually typed into the survey and a time stamp to the response which includes time and date of the completion of the survey. In addition, Google Forms also keeps the responses of the participants secure by using HTTPS, a secure version of the communication protocol (HTPP) on the internet. HTTPS establishes a secure channel over an insecure network of internet by encrypting the transferred data. This means that nobody can intercept and examine the data the respondent provides. To conclude, Google Forms ensures that the privacy of the respondent is kept at maximum level.

Lastly the reliability of the last part of the questionnaire which is Attitudes towards ICT in Education Part is determined by calculating Cronbach's alpha coefficient and it is found to be 0.775 which is above the accepted value of 0.70 for

reliability as shown in Table 1.

		Ν	%
	Valid	302	100
Cases	Excluded	0	0
	Total	302	100
	Reliability	Statistics	
Cronb	ach's Alpha	N of It	ems
	0.775		15

Table 1. Cronbach's Alpha Value for the Attitudes towards ICT in Education Part of the Questionnaire

The last part of the questionnaire is based on the STATICTE instrument which was developed by Çavaş et al. and its face and content validity were determined by sending the instrument to seven experts who were working in the field of ICT in education in different Turkish universities and improving the instrument by the help of the feedback from these experts (Çavaş et al., 2009).

The research questionnaire consists of three sections:

- Part 1 : Demographic Information Part
- Part 2 : Technical Experience and Skills Part
- Part 3 : Attitudes towards ICT in Education Part

The first section which is called Demographic Information Part consists of six questions about respondents' demographic information which includes age, gender, academic rank, academic discipline, teaching experience and university location in terms of geographic area. The second section which is called Technical Experience and Skills Part consists of twelve questions about respondents' experiences and skills in using technology in their personal and professional lives. This part also includes questions about computer and smart phone ownership. The last section of the questionnaire which is called Attitudes towards ICT in Education is based on the STATICTE instrument which stands for 'Science Teachers' Attitudes towards ICT in Education' (Cavaş et al., 2009) which consists of thirty four Likert-type questions which were prepared to measure the attitudes of high school science teachers towards the use of ICT in education. Because the target group of this survey is university instructors from various academic disciplines, fifteen relevant questions in which nine of them are positively worded and six of them are negatively worded were selected from STATICTE instrument by a group of thirty university instructors in order to make the instrument more suitable for higher education.

The survey was designed to respond anonymously. It was also compulsory for the respondents to answer all of the questions to successfully submit the survey so none of the responses was removed from the collected data because of missing information in any item. It was decided to do so because there was a possibility of low response rate due to the nature of web-based surveys and it was thought to be better not to remove any responses because of a missing information in any item that may indirectly contribute to the low response rate. The three parts of the questionnaire will be explained in detail in the following section.

Part 1: Demographic Information Part

The first part of the questionnaire consists of six multiple-choice questions about the demographics of the participants. These are:

- 1. Gender
- 2. Age
- 3. Years of Teaching Experience
- 4. Academic Rank
- 5. Academic Discipline
- 6. University Location in terms of Geographic Area

In the first question, participants were asked to choose their gender from the list which are designed as two radio buttons as a 'Female' or 'Male'. Age is asked as a categorical variable and participants were allowed to choose one of the following choices from radio button list: 'Under 36', '36-49', 'Above 49'. The third question asked the years of teaching experience of the participant as a categorical variable and participants chose one of the options from the radio button list: '0-5', '6-10', '11-15', '16-20', '21 and above'. The fourth question asked the academic rank and participants were supposed to choose one of the options from the radio button list: 'Professor', 'Associate Professor', 'Assistant Professor'. The fifth question asked the academic discipline and participants were allowed to choose one of the eleven options from the radio button list: 'Education Sciences', 'Natural Sciences and Mathematics', 'Engineering', 'Law', 'Architecture', 'Religious Studies', 'Philology', 'Medical Sciences', 'Social Sciences', 'Agriculture Sciences', 'Arts'. These academic disciplines were adapted from the list of academic disciplines in Turkish universities which was published in Turkish Inter-University Committee Board's

web page. (Turkish Inter-University Committee Board, 2003). The last question in this part asked the university location in terms of geographic area and participants were allowed to choose one of the seven geographic areas of Turkey from the radio button list: 'Marmara', 'Aegean', 'Central Anatolia', 'Mediterranean', 'Black Sea', 'Eastern Anatolia', 'Southeastern Anatolia'. The first part of the questionnaire can be seen in Table 2.

Т

1. Gender	5. Academic Discipline
O Male	 Educational Sciences
O Female	O Natural Sciences and Mathematics
2. Age	C Engineering
O Under 36	C Law
O 36-49	O Architecture
O Above 49	 Religious Studies
3. Teaching Experience	O Philology
© 0-5 years	O Medical Sciences
○ 6 – 10 years	O Social Sciences
0 11 – 15 years	 Agriculture Sciences
○ 16 – 20 years	O Arts
O Above 21 years	6. Geographical Area
4. Academic Rank	O Marmara
O Professor	C Aegean
O Associate Professor	O Central Anatolia
O Assistant Professor	O Mediterranean
	O Black Sea
	C Eastern Anatolia
	C Southeastern Anatolia

Table 2. Demographic Information Part of the Questionnaire

Part 2: Technical Experience and Skills Part

This part consists of twelve questions in total which can be seen at Table 3. These questions were compiled from various sources which were referenced at Table 4. The questions in this part were asked in order to find instructors' current use of the computers and related technologies in their personal and professional lives, their level of expertise with computer technologies in educational context. Eleven of them are 'Yes' and 'No' questions and one of them is categorical question which aims to find the frequency of internet usage of the participants.

		01111111		
1.	Do you have a computer in your home?	Yes	No	
2.	Do you have internet connection in your home?	Yes	No	
3.	Do you use smart phone?	Yes	No	
	4. How many hours do you use internet in a day?		Less than 1 hour	
4.			Between 1 – 5 hours	
		More than	15 hours	
5.	Can you use at least one of the Microsoft Office software such as Word, Excel or Power Point very well?	Yes	No	
6.	Can you solve any problem that you encounter when you are using your computer?	Yes	No	
7.	Can you prepare electronic course materials using various software with your computer?	Yes	No	
8.	Do you share your course materials electronically with your students?	Yes	No	
9.	Do you have a web-site for at least one of your courses?	Yes	No	
10.	Have you ever taught via internet?	Yes	No	
11.	Do you use online discussion forums for educational purposes?	Yes	No	
12.	Do you use online learning management systems such as Moodle?	Yes	No	

Table 3. Technical Experience and Skills Part of the Questionnaire

Part 2 Questions	Reference
1. Do you have a computer in your home?	Adapted from Chen, Lim & Tan (2010)
2. Do you have internet connection in your home?	Adapted from Çavaş et. al. (2009)
3. Do you use smart phones?	Adapted from Chen, Lim & Tan (2010)
4. How many hours do you use internet in a day?	Adapted from Zhou & Xu (2007)
5. Can you use at least one of the Microsoft Office	
programs such as Word, Excel or Power point very	Adapted from Zhou & Xu (2007)
well?	
6. Can you solve any problem that you encounter when	Adopted from Garland & Noves (2004b)
you are using your computer?	
7. Can you prepare electronic course materials using	Adapted from Chen Lim & Tan (2010)
various software with your computer?	
8. Do you share your course materials electronically	Adapted from Chen. Lim & Tan (2010)
with your students?	
9. Do you have a web-site for at least one of your	Adapted from Zhou & Xu (2007)
courses?	
10. Have you ever taught via internet?	Adapted from Akaslan & Law (2010)
11. Do you use online discussion forums for	Adapted from Chen Lim & Tan (2010)
educational purposes?	
12. Do you use online learning management systems	Adapted from Chen, Lim & Tan (2010)
such as Moodle?	The run (2010)

Table 4. Sources of Questions of Technical Experience and Skills Part

The first three questions asked the participants' ownership of computer in home, internet connections in home and smart phone. The fourth question asked the frequency of participants' internet usage in a day. Participants chose one of the three options: 'Less than 1 hour', 'Between 1 and 5 hours', 'More than 5 hours'. The fifth question asked whether the participant can use at least one of the Microsoft Office programs such as Word, Excel or PowerPoint very well. The sixth question asked whether the participant can solve any problem that s/he encounters when s/he is using computers. The seventh question aimed to find whether the participant can prepare electronic course materials by using various software. The eighth question asked whether the participant is sharing course materials with students electronically. The ninth question asked whether the participant has a web-site for at least one of the courses s/he offered. The tenth question asked whether the participant has ever taught via internet. The last two questions aimed to find whether the participant is using online discussion forums for educational purposes and online learning management systems such as Moodle.

Part 3: Attitudes towards ICT in Education Part

The last part of the questionnaire consists of fifteen statements with five point Likerttype scale (1: Strongly Disagree, 2: Disagree, 3: Neutral, 4: Agree, 5: Strongly Agree). The statements in this part were directly adapted from STATICTE instrument (Çavaş et al., 2009) which was developed to investigate high school science teachers' attitudes towards ICT in education. There are thirty one statements in total in this instrument and fifteen of them were adapted for this part of the questionnaire. Because the aim of this study is to investigate the instructors' attitudes towards ICT in higher educational institutions, it was decided to take the most appropriate statements for university instructors. For this reason, the original version of the STATICTE instrument was sent to a group of thirty university instructors from different academic disciplines with different academic ranks. They were asked to

remove the statements in the instrument which are not directly relevant for higher education. In the light of the feedbacks and comments from these university teachers, sixteen items were removed from the original STATICTE instrument and fifteen questions were decided to be relevant for the higher education.

In this part, participants stated their general ICT attitudes by answering fifteen statements in which nine of them are positively worded and six of them are negatively worded. The statements for the Attitudes towards ICT in Education can be seen in Table 9. Each statement is given a special name like Attitude1 and Attitude2 which will be used to differentiate attitudes when conducting the difference tests in the Chapter 5 'Analyses and Findings Part'. The following list of the attitudes are positively worded attitudes: Attitude1, Attitude3, Attitude4, Attitude7, Attitude8, Attitude9, Attitude11, Attitude14, Attitude15; whereas the followings are the negatively worded attitudes: Attitude2, Attitude5, Attitude6, Attitude10, Attitude12, Attitude13.

Items
Attitude1) I believe that the usage of ICT is important in achieving the aims of
curriculum.
Attitude2) The usage of ICT in the courses brings too much overload.
Attitude3) I think that the usage of ICT improves the teacher's performance.
Attitude4) I believe that the students will be more interested in the courses that
are implemented with ICT.
Attitude5) It is luxurious to use ICT in schools in our country.
Attitude6) I think that it is difficult to use ICT in the courses.
Attitude7) I believe that ICT support facilitates the learning.
Attitude8) I believe that using audio and visual tools in my classes is useful.
Attitude9) I think that the usage of ICT in the courses will improve the students'
success.
Attitude10) I think ICT is a rival to teachers.
Attitude11) I believe that audio-visual tools enhance the learning permanence.
Attitude12) I think that ICT restricts the creativity of the teachers.
Attitude13) I think that it is a waste of time to use ICT tools in the courses.
Attitude14) I believe that ICT enhances the motivation of the students.
Attitude15) I think that the efficient usage of ICT is one of the requirements for
being a "good teacher".

Table 5. Attitudes towards ICT in Education Part of the Questionnaire

Sampling

Because the main aim of this study is to investigate the university teachers' attitudes towards the use of ICT in education, the teachers in higher educational institutions are the subjects of this study. Three universities were chosen randomly from each geographic area of Turkey. Twenty one universities were chosen in total. The list of the selected universities from seven different geographic areas of Turkey can be seen in Table 10.

Table 6. The List of the Selected Universities

Marmara
1. Boğazici University
2. Namık Kemal University
3. Istanbul Technical University
Aegean
4. Ege University
5. Celal Bayar University
6. İzmir Institute of Technology
Central Anatolia
7. Middle East Technical University
8. Bilkent University
9. Gazi University
Mediterranean
10. Çukurova University
11. Mersin University
12. Sütçü İmam University
Black Sea
13. Ondokuz Mayıs University
14. Karadeniz Technical University
15. Bulent Ecevit University
Eastern Anatolia
16. Atatürk University
17. İnönü University
18. Ağrı University
Southeastern Anatolia
19. Dicle University
20. Gaziantep University
21. Harran University

After the selection of universities, the e-mail addresses of professors, associate professors and assistant professors from each university were retrieved from web pages of the departments if available. Then the survey was sent to 5646 instructors via e-mail. Just to make sure that these e-mails will not be treated as spam, it was consulted to computer technology support specialists from Boğaziçi University Computer Center. By taking their suggestions into account, these e-mails were sent in a time interval of thirty days. Each day at most two hundred e-mails were sent. In addition, these two hundred e-mails were not sent at the same time in a day, only twenty e-mails were sent at the same time in each hour. Although it is technically impossible to be sure that these e-mails were not treated as spam, the computer specialists from Boğaziçi University Computer Center said that it is extremely unlikely that these e-mails were treated as spams if they were sent in the way they suggested. The e-mail consisted of a brief statement of the rationale of the survey and a web link to the questionnaire. The original version of the e-mail which was sent to instructors can be seen in Appendix A. 302 instructors from various academic disciplines and different years of teaching experience have responded to the questionnaire. The response rate of the survey is 5.35%. All items were made compulsory to be answered to successfully submit the questionnaire, so all respondents submitted the questionnaire by responding all of the items in the survey.

CHAPTER 5

ANALYSES AND FINDINGS

In this chapter, the analyses of the survey data will be shown and the findings will be presented. Initially, the statistical analysis methods which were used in this study will be explained, and then the descriptive findings will be shown and discussed in detail. In this part, firstly demographic profiles of the participants will be illustrated, then their technical experiences and skills will be presented. After this part, the means and distribution of the instructors' attitude score will be shown. Finally, the findings of the difference tests will be presented and discussed.

In the data analysis, descriptive findings were used to describe and summarize the properties of the data collected from the respondents. Parametric statistics like independent sample t-test and one-way ANOVA were used to find any differences between instructors with different personal characteristics such as age, gender, academic rank, academic discipline, years of teaching experience and location of current occupation in terms of their attitude towards the use of ICT in education.

Independent sample t-tests are used if there are two different ('independent') groups and their mean score will be compared on some continuous variable. Independent sample t-test was used in the first section of the difference tests to find if there is a statistically significant difference between instructors of different (male and female) genders in terms of their attitudes towards ICT in education. One-way analysis of variance (ANOVA) is very similar to independent sample t-test in many ways, but it is used if there are three or more groups and their mean score will be compared on a continuous variable. A one-way ANOVA analysis can tell if the

groups differ significantly or not, but it does not tell which groups differ significantly. To determine where the significant difference is, post-hoc comparison tests should be conducted. One-way ANOVA was used for the rest of the difference tests to find if there is a statistically significant difference between instructors of different 'age' (three groups) with different 'teaching experiences' (five groups), different 'academic ranks' (three groups), different 'academic disciplines' (eleven groups) and 'different locations of current occupation' (seven groups) in terms of their attitudes towards ICT in education. The Tukey HSD and Dunnett C post-hoc tests were employed to determine the mean difference between the pairs of groups which proved to be significantly different from one another in one-way ANOVA tests.

The data were analyzed using IBM SPSS Statistics version 21 for Windows. The level of statistical significance was determined as 0.05 (Fisher,1925). Since the survey was conducted online via Google Forms, the results were exported directly from the Google Spreadsheets application as a Microsoft Office 2007 Excel file. Before copying data into SPSS software, text part of the responses was coded into numbers. Negatively worded items in the last part of the questionnaire were also reversed, and then the data were imported into IBM SPSS Statistics software. Descriptive findings were used for the first and second part of the questionnaire which are 'Demographic Part' and 'Technical Experience and Skills' Part respectively. The last part of the questionnaire which measures the attitudes of instructors towards the use of ICT in education consists of the fifteen items with five point Likert-type scale (1: Strongly Disagree, 2: Disagree, 3: Neutral, 4: Agree, 5: Strongly Agree).
Descriptive Findings

Demographic Profile of the Respondents

Demographic characteristics of the respondents are presented in the Table 7. 65% of the respondents are male and 35% of the respondents are female. About half of the respondents' age is between 36 and 49. For the case of teaching experiences, we have an almost equally distributed sample of respondents except the ones with '0 and 5 years' of teaching experience. Almost half of the respondents (46%) are assistant professors, the number of associate professors (26%) and professors (28%) are close. The academic discipline of respondents varies a lot with the instructors in Educational Sciences, Natural Sciences and Mathematics, Engineering and Social Sciences constitute 71% of the total respondents. Lastly, there are at least forty respondents from each geographic area of Turkey so it can be said that sampling is equally distributed across Turkey.

	Gender	
	Frequency	Percentage (%)
Female	107	35
Male	195	65
Total	302	100
	Percentage (%)	
Under 36	68	23
	157	52
36 – 49	157	52
36 – 49 Above 49	77	25

Table 7. Demographic Profile of Respondents

Teaching Experience					
	Frequency	Percentage (%)			
0-5 years	24	8			
6 – 10 years	63	21			
11 – 15 years	70	23			
16 – 20 years	69	23			
21 and above years	76	25			
Total	302	100			
	Academic Rank				
	Frequency	Percentage (%)			
Assistant Prof.	139	46			
Associate Prof.	79	26			
Professor	84	28			
Total	302	100			
	Academic Discipline				
	Frequency	Percentage (%)			
Educational Sci.	41	14			
Natural Sci Math	58	19			
Engineering	53	17			
Law	5	2			
Architecture	10	3			
Religious Studies	14	5			
Philology	12	4			
Medical Sciences	24	8			
Social Sciences	65	21			
Agriculture Sci.	15	5			
Arts	5	2			
Total	302	100			
	Geographic Area				
	Frequency	Percentage (%)			
Marmara	50	17			
Aegean	43	14			
Central Anatolia	45	15			
Mediterranean	42	14			
Black Sea	41	14			
Eastern Anatolia	40	12			
Southeastern Anat.	41	14			
Total	302	100			

Technical Experience and Skills of the Respondents

	Items	Yes	No		
1.	Do you have a computer in your home?	291- (96%)	11- (4%)		
2.	Do you have the internet connection in your home?	275- (91%)	27- (9%)		
3.	Do you use smart phone?	174- (58%)	128- (42%)		
4	How more hours do not use the internet in a doug	Less than 1 hour: 36- (12%)		
4.	How many hours do you use the internet in a day?	Between 1 – 5 hours: 1	Between 1 – 5 hours: 199- (66%)		
		More than 5 hours: 67-	· (22%)		
5.	Can you use at least one of the Microsoft Office software such as Word, Excel or Power Point very well?	288- (95%)	14- (5%)		
6.	Can you solve any problem that you encounter when you are using your computer?	201- (67%)	101- (33%)		
7.	Can you prepare electronic course materials using various software with your computer?	240- (80%)	62- (20%)		
8.	Do you share your course materials electronically with your students?	190- (63%)	112- (37%)		
9.	Do you have a web-site for at least one of your courses?	89- (30%)	213- (70%)		
10.	Have you ever taught via internet?	49- (16%)	253- (84%)		
11.	Do you use online discussion forums for educational purposes?	134- (44%)	168- (56%)		
12.	Do you use online learning management systems such as Moodle?	66- (22%)	236- (78%)		

Table 8. Scores of Technical Experience and Skills of the Respondents

As it can be seen in Table 8, nearly all of the respondents (96%) have computers in their homes. Although today portable and tablet computers are becoming popular, having a computer in home can mean that a computer is needed in home which indicates this computer may be actively used in home. Most of the respondents (91%) have also the internet connection in their homes. More than half of the respondents (58%) use smart phones. A large percentage of the respondents (66%) say that they use internet between 1 and 5 hours in a day. These figures clearly indicate that most of the respondents are already exposed to computers and internet

in their homes as expected so it will not be unfair to think that technology is not something new to the instructors in higher education institutions.

95% of the respondents can use at least one of the Microsoft Office programs very well and 67% of the respondents can solve any problem they encounter when they are using their computers. These figures show that they can easily prepare simple electronic course materials by using Microsoft Office software even if they don't have advanced computer skills and most of them feel confident when using and 'fixing' their computers.

80% of the respondents say that they can prepare electronic course materials with their computers which is an expected finding because 95% of the respondents already said they can use at least one of the Microsoft Office software. 63% of them shares their course materials electronically with their students. Not only majority of the instructors are preparing electronic course materials, but also they are utilizing technology to share their materials with students electronically. These figures show us that most of the instructors in higher education are already using ICT tools for their teaching practices inside and outside the classroom.

29% of the respondents has a web-site for at least one of their courses and only 16% have thought via internet. So, it can be said that most of the instructors in higher education have not experienced e-learning and distance learning, and they do not know how to make a simple web-site for their courses and publish it via internet. This can be considered as an obstacle for the instructors to fully embrace the advantages of using ICT in their teaching practices.

Although 44% of the respondents have been using online discussion forums for their courses, only 22% of the respondents have used online learning management systems (LMSs) such as Moodle. LMSs can be extremely useful when

they are used appropriately because they can provide instructors numerous opportunities to easily integrate advanced technological services into their courses. If only 22% of the respondents are using LMSs, it can be because of the fact that learning to use learning management systems is not an easy task and it may require attending a formal training course. So it can be said that most of the instructors in higher education institutions do not get enough formal training for learning how to use LMSs.

In short, the data from Technical Experience and Skills Part of the survey reveals that most of the instructors in higher educational institutions have moderate level of professional experience of using ICT in their teaching practices. Again, most of the instructors have their personal computers and a majority has the internet access at their homes and they use the internet between 1 and 5 hours in a day. However their level of exposure to e-learning and online learning management systems such as Moodle is low which can be considered as an obstacle for the instructors to fully embrace the advantages of using ICT in their teaching practices.

The Instructors' Attitudes towards the Use of ICT

The instructors' attitudes towards the use of ICT in education were assessed by an attitude scale made up of 15 Likert-type items rated between 1 and 5 (1: Strongly Disagree, 2: Disagree, 3: Neutral, 4: Agree, 5: Strongly Agree). Nine of the total items are positively worded and six of the total items are negative worded. To explore the attitudes of the university instructors regarding the educational use of ICT, total means and standart deviations were calculated for each statement in the last part of the questionnaire. The means and distribution of the instructors' attitude scores can be seen in Table 9. 302 participants in total responded to the survey.

The data shows that the instructors in higher education across Turkey have a favorable attitude towards the use of ICT in their classrooms (overall mean: 4.12). The instructors agreed with nine positive statements about the effect of ICT on teaching and learning (e.g. 'I believe that ICT enhances the motivation of the students', 'I believe that ICT support facilitates the learning'). They disagreed with four of the six negative statements about the effect of ICT on teaching and learning (e.g. 'I think it is a waste of time to use ICT tools in the courses.', 'I think ICT restricts the creativity of the teachers.'). On the other hand, they did not completely disagree with the following two negative statements: 'The usage of ICT in the courses brings too much overload.' (M: 2.74) and 'I think that it is difficult to use ICT in the courses.' (M: 2.55). This reveals that although Turkish university instructors who participated to this survey strongly agree with the educational benefits of ICT in higher education and they seem to believe that the use of ICT is useful for their teaching and instruction, they still appear to think that the use of ICT in their classes is difficult and brings too much overload. The detailed results are

shown in Table 9. The mean values of all items except Attitude 2 and Attitude 6

clearly indicate favorable attitudes towards the use of ICT in higher education.

Items	Mean	Standart Deviation
<i>Attitude8</i> . I believe that using audio and visual tools in my classes is useful.	4.66	0.687
<i>Attitude1</i> . I believe that the usage of ICT is important in achieving the aims of curriculum.	4.59	0.699
<i>Attitude9</i> . I think that the usage of ICT in the courses will improve the students' success.	4.56	0.726
<i>Attitude13</i> . I think that it is a waste of time to use ICT tools in the courses.	4.50	0.896
<i>Attitude5</i> . It is luxurious to use ICT in schools in our country.	4.44	0.941
<i>Attitude11</i> . I believe that audio-visual tools enhance the learning permanence.	4.41	0.963
<i>Attitude4</i> . I believe that the students will be more interested in the courses that are implemented with ICT.	4.36	0.914
<i>Attitude3</i> . I think that the usage of ICT improves the teacher's performance.	4.32	0.925
<i>Attitude12</i> . I think that ICT restricts the creativity of the teachers.	4.31	1.017
<i>Attitude7</i> . I believe that ICT support facilitates the learning.	4.27	0.960
Attitude10. I think ICT is a rival to teachers.	4.24	1.233
<i>Attitude14</i> . I believe that ICT enhances the motivation of the students.	3.91	1.184
<i>Attitude15</i> . I think that the efficient usage of ICT is one of the requirements for being a "good teacher".	3.91	1.301
<i>Attitude2</i> . The usage of ICT in the courses brings too much overload.	274	1.360
Attitude6. I think that it is difficult to use ICT in the courses.	2.55	1.362

Table 9. The Means and Distribution of the Instructors' Attitude Score*

*The table were ordered according to mean values.

Findings of the Difference Tests

1. Test of Difference in Attitudes towards ICT in Education between Gender Groups

An independent sample t-test was applied to gender (male and female) and every single item in the last part of the questionnaire. It has been found that there is no statistically significant difference between the instructors of different genders in terms of their attitudes towards the use of ICT in education. The results of this analysis are shown in Table 11. The more detailed results of this analysis can be seen in Table 1 in the Appendix B. In addition, the effect size values (Cohen's d) were calculated to find the practical significance of the test. Cohen's d values can be seen in Table 10. Cohen argued that d values of 0.2, 0.5 and 0.8 represent small, medium and large effect sizes respectively (Cohen, 1988). Therefore, Cohen's effect size values (ds < 0.5) in Table 10 suggest low practical significance.

Table 10. Liteet Size valu	
Attitude1 * Gender	.028
Attitude2 * Gender	.066
Attitude3 * Gender	.021
Attitude4 * Gender	.043
Attitude5 * Gender	.223
Attitude6 * Gender	.029
Attitude7 * Gender	.031
Attitude8 * Gender	.207
Attitude9 * Gender	.067
Attitude10 * Gender	.057
Attitude11 * Gender	.189
Attitude12 * Gender	.067
Attitude13 * Gender	.157
Attitude14 * Gender	.135
Attitude15 * Gender	.007

Table 10. Effect Size Values (Cohen's d) for Attitudes towards ICT by Gender

Independent Samples Test							
	Levene's Test for Equality of Variances		t-test for Equality of Means				
		F	Sia.	Sig. (2-tailed)	Mean Difference	Std. Error Difference	
Attitude1	Equal variances assumed	.030	.863	.873	014	.084	
	Equal variances not assumed			.874	014	.085	
Attitude2	Equal variances assumed	.086	.769	.596	.087	.164	
	Equal variances not assumed			.595	.087	.164	
Attitude3	Equal variances assumed	1.334	.249	.898	014	.111	
	Equal variances not assumed			.900	014	.114	
Attitude4	Equal variances assumed	.181	.671	.719	040	.110	
	Equal variances not assumed			.723	040	.111	
Attitude5	Equal variances assumed	1.223	.270	.064	.210	.113	
	Equal variances not assumed			.066	.210	.113	
Attitude6	Equal variances assumed	.504	.478	.803	041	.164	
	Equal variances not assumed			.805	041	.165	
Attitude7	Equal variances assumed	.013	.908	.774	033	.116	
	Equal variances not assumed			.768	033	.113	
Attitude8	Equal variances assumed	5.201	.023	.085	143	.082	
	Equal variances not assumed			.074	143	.080	
Attitude9	Equal variances assumed	.062	.804	.565	050	.087	
	Equal variances not assumed			.577	050	.090	
Attitude10	Equal variances assumed	.061	.805	.617	074	.148	
	Equal variances not assumed			.613	074	.147	
Attitude11	Equal variances assumed	2.250	.135	.112	184	.116	
	Equal variances not assumed			.105	184	.113	
Attitude12	Equal variances assumed	.381	.537	.528	077	.122	
	Equal variances not assumed			.539	077	.126	
Attitude13	Equal variances assumed	.754	.386	.186	143	.108	
	Equal variances not assumed			.183	143	.107	
Attitude14	Equal variances assumed	.046	.829	.255	162	.142	
	Equal variances not assumed			.254	162	.142	
Attitude15	Equal variances assumed	.038	.846	.921	.016	.157	
	Equal variances not assumed			.920	.016	.156	

Table 11. Independent sample t-test: Attitudes towards ICT by Gender

In the literature, previous research reported conflicting results in terms of the relationship between gender and instructors' attitudes. While some studies show that there is a gender difference in attitudes towards ICT (Rozell & Gardner, 2000; Hong et al., 2002; Shapkaa & Ferrari, 2003; Garland & Noyes, 2004), other studies report little or no differences in instructor attitudes on the basis of gender (Kramer & Lehman; 1990; Whitley, 1997; Koszalka, 2001). In this study, there has been found no differences in the attitudes between instructors of different genders. This can be because of the fact that instructors are highly educated people who can appreciate the educational benefits of ICT, so their attitudes towards ICT can be similar irrespective of their gender.

One-way ANOVA test was applied to age and every single item in the last part of the questionnaire. It has been found that there is no statistically significant difference between instructors of different ages in terms of their attitudes towards the use ICT in education. The results of this analysis can be seen in Table 13. The more detailed results of this analysis can be found in Table 2 in the Appendix B. In addition, the effect size values (Cohen's f^2) were calculated to find the practical significance of the test. Cohen's f^2 values can be seen in Table 12. Cohen argued that f^2 values of 0.02, 0.15 and 0.35 represent small, medium and large effect sizes respectively (Cohen, 1988). Therefore, Cohen's effect size values ($f^2 < 0.15$) in Table 12 suggest low practical significance.

Table 12. Effect Size values	(Conch sj
Attitude1 * Age	.0035
Attitude2 * Age	.0025
Attitude3 * Age	.0090
Attitude4 * Age	.0055
Attitude5 * Age	.0096
Attitude6 * Age	.0032
Attitude7 * Age	.0037
Attitude8 * Age	.0091
Attitude9 * Age	.0017
Attitude10 * Age	.0026
Attitude11 * Age	.0023
Attitude12 * Age	.0018
Attitude13 * Age	.0110
Attitude14 * Age	.0132
Attitude15 * Age	.0025

Table 12. Effect Size Values (Cohen's f^2) for Attitudes towards ICT by Age

In the literature, there are conflicting findings for the relationship between age and attitudes towards ICT. For instance, while some studies indicated that there is no significant difference in instructors' attitudes with respect to age (Massoud, 1991; Woodrow, 1992; Handler, 1993), other studies showed that age has a significant effect on attitudes towards ICT (Chio, 1992; Blankenship, 1998; Jennings & Onwuegbuzie, 2001; Adams, 2002; Wagner, Hassanein & Head, 2010).

			df	Mean	Б	Sia
		Squares	u	Square		Siy.
Attitude 1	Between Groups	.507	2	.254	.517	.597
Attitude 2	Between Groups	1.395	2	.698	.376	.687
Attitude 3	Between Groups	2.296	2	1.148	1.345	.262
Attitude 4	Between Groups	1.363	2	.682	.815	.444
Attitude 5	Between Groups	2.546	2	1.273	1.442	.238
Attitude 6	Between Groups	1.781	2	.891	.478	.620
Attitude 7	Between Groups	1.027	2	.514	.556	.574
Attitude 8	Between Groups	1.282	2	.641	1.360	.258
Attitude 9	Between Groups	.277	2	.138	.261	.770
Attitude 10	Between Groups	1.168	2	.584	.383	.682
Attitude 11	Between Groups	.630	2	.315	.338	.714
Attitude 12	Between Groups	.557	2	.279	.268	.765
Attitude 13	Between Groups	2.621	2	1.311	1.641	.196
Attitude 14	Between Groups	5.498	2	2.749	1.974	.141
Attitude 15	Between Groups	1.276	2	.638	.375	.687

Table 13. One-way ANOVA: Attitudes towards ICT by Age

3. Test of Difference in Attitudes towards ICT in Education between 'Teaching Experience' Groups

One-way ANOVA test was applied to the teaching experience of the respondents which is asked as a categorical variable in the first of the questionnaire ('0-5 years', '6-10 years', '11-15 years', '16-20 years', 'Above 20 years') and every single item in the last part of the questionnaire. It has been found that there is a statistically significant difference between instructors with different levels of teaching experiences in terms of their three attitudes (Attitude3, Attitude4, Attitude8) towards the use of ICT in education. However, no statistically significant differences in the other attitudes towards ICT between the instructors with different years of teaching experience were detected. All attitudes in the last part of the questionnaire are shown in Table 14.

Table 14. Attitudes towards ICT in Education

Items
Attitude1) I believe that the usage of ICT is important in achieving the aims of
curriculum.
Attitude2) The usage of ICT in the courses brings too much overload.
Attitude3) I think that the usage of ICT improves the teacher's performance.
Attitude4) I believe that the students will be more interested in the courses that
are implemented with ICT.
Attitude5) It is luxurious to use ICT in schools in our country.
Attitude6) I think that it is difficult to use ICT in the courses.
Attitude7) I believe that ICT support facilitates the learning.
Attitude8) I believe that using audio and visual tools in my classes is useful.
Attitude9) I think that the usage of ICT in the courses will improve the students'
success.
Attitude10) I think ICT is a rival to teachers.
Attitude11) I believe that audio-visual tools enhance the learning permanence.
Attitude12) I think that ICT restricts the creativity of the teachers.
Attitude13) I think that it is a waste of time to use ICT tools in the courses.
Attitude14) I believe that ICT enhances the motivation of the students.
Attitude15) I think that the efficient usage of ICT is one of the requirements for
being a "good teacher".

In addition, the effect size values (Cohen's f^2) were calculated to find the practical significance of the test. Cohen's f^2 values can be seen in Table 15. Cohen argued that f^2 values of 0.02, 0.15 and 0.35 represent small, medium and large effect sizes respectively (Cohen, 1988). Therefore, Cohen's effect size values ($f^2 < 0.15$) in Table 15 suggest low practical significance.

Experience	
Attitude1 * TeachingExperience	.0080
Attitude2 * TeachingExperience	.0214
Attitude3 * TeachingExperience	.0356
Attitude4 * TeachingExperience	.0332
Attitude5 * TeachingExperience	.0091
Attitude6 * TeachingExperience	.0318
Attitude7 * TeachingExperience	.0084
Attitude8 * TeachingExperience	.0376
Attitude9 * TeachingExperience	.0150
Attitude10 * TeachingExperience	.0085
Attitude11 * TeachingExperience	.0037
Attitude12 * TeachingExperience	.0288
Attitude13 * TeachingExperience	.0311
Attitude14 * TeachingExperience	.0081
Attitude15 * TeachingExperience	.0104

Table 15. Effect Size Values (Cohen's f^2) for Attitudes towards ICT by Teaching Experience

Table 16 shows the ANOVA analysis results for the years of teaching experience with respect to Attitude3, Attitude4 and Attitude8. Only these three attitudes are shown in Table 16 because their levels of significance are lower than 0.05. The more detailed results of this analysis which include all items are available in Table 3 in the Appendix B.

	ANOVA						
Sum of Mean Squares df Square F Sig							
Attitude3	Between Groups	8.843	4	2.211	2.641	.034	
	Within Groups	248.640	297	.837			
	Total	257.483	301				
Attitude4	Between Groups	8.073	4	2.018	2.464	.045	
	Within Groups	243.305	297	.819			
	Total	251.377	301				
Attitude8	Between Groups	5.155	4	1.289	2.793	.027	
	Within Groups	137.031	297	.461			
	Total	142.185	301				

Table 16. ANOVA Analysis for Years of Teaching Experience and Attitudes for the 3^{rd} , 4^{th} and 8^{th} items

A one-way ANOVA analysis can determine if the groups differ significantly or not, but it does not tell which groups differ significantly. To determine which groups are significantly different from one another, post-hoc multiple comparison tests should be conducted. These post-hoc multiple comparison tests involve comparisons between the pairs of the groups. For example if a group has three levels, three pairwise comparisons might be conducted to compare the means of groups 1 and 2, the means of groups 1 and 3, and the means of groups 2 and 3 (Green & Salking, 2005). In this study, 'Tukey HSD' and 'Dunnett C' were used as post-hoc multiple comparison tests. 'Tukey HSD' test assumes equal variances whereas 'Dunnett C' test assumes that variances are not equal.

In this study, it was found that there is a statistically significant difference in Attitude 3 (p = .034), Attitude 4 (p = .045) and Attitude 8 (p = .027) towards ICT between instructors who have different years of teaching experiences as shown in Table 16. However, the results of one-way ANOVA do not say which groups are significantly different from one another. The results of post-hoc comparison tests ('Tukey HSD' and 'Dunnett C') should be evaluated to find which groups are

significantly different from one another. To determine whether to use Tukey HSD or Dunnett C as the post-hoc comparison test, it should be first determined whether the groups have equal variances. Levene's test for homogeneity of variance can be used to test the assumption that each group of the independent variable has the same variance. If the Levene statistic is significant at the 0.05 level (p < .05), we reject the null hypothesis that the groups have equal variances. Levene's test for homogeneity of variance was conducted and the results of this test for the three attitudes are shown in Table 17.

Test of Homogeneity of Variances						
		Levene Statistic	df1	df2	Sig.	
	Attitude3	2.457	4	297	.046	
	Attitude4	1.906	4	297	.109	
	Attitude8	7.195	4	297	.000	

Table 17. Test of Homogeneity of Variance for ANOVA Analysis for Years of Teaching Experience and Attitudes

Firstly, Levene's test for homogeneity of variance for Attitude 3, as shown in Table 17, is significant (p = 0.046) so we reject the null hypothesis that the groups have equal variances therefore the results of Dunnett C in Table 18 must be used to evaluate the data because Dunnett C assumes that the variances are not equal. When we look at the Dunnett C row in Attitude 3 at Table 18, it can be seen that there is only one statistically significant difference (p = 0.016) between pairs '6-10' and 'Above 20'. Therefore the results of Dunnett C post-hoc multiple comparison test show that there is a statistically significant difference in Attitude 3 between the instructors with a teaching experience of 6-10 years and the instructors with a teaching experience of more than 20 years. (An asterisk in Mean Difference column

indicates which pairwise comparisons are significant at the 0.05 significance level when using Dunnett C test). When we look at the mean difference values in Table 18, the mean difference between '6-10' and 'Above 20' for Attitude 3 is positive (0.490) which indicates that the instructors with a teaching experience of 6-10 years appear to think more positively that '*the usage of ICT improves the instructor's performance*' than the instructors with a teaching experience of more than 20 years.

Multiple Comparisons								
Depender	nt Variable			Mean Difference	Std.	Sig	95% Cor Inte Lower Bound	nfidence rval Upper Bound
Attitude3	Tukey	0 - 5	6 - 10	181	.219	.924	78	.42
	HSD		11 - 15	011	.216	1.000	60	.58
			16 - 20	.085	.217	.995	51	.68
			Above 20	.309	.214	.600	28	.90
		6 - 10	0 - 5	.181	.219	.924	42	.78
			11 - 15	.170	.159	.822	27	.61
			16 - 20	.266	.159	.456	17	.70
			Above 20	.490 [*]	.156	.016	.06	.92
		11 - 15	0 - 5	.011	.216	1.000	58	.60
			6 - 10	170	.159	.822	61	.27
			16 - 20	.096	.155	.972	33	.52
			Above 20	.320	.152	.218	10	.74
		16 - 20	0 - 5	085	.217	.995	68	.51
			6 - 10	266	.159	.456	70	.17
			11 - 15	096	.155	.972	52	.33
			Above 20	.224	.152	.581	19	.64
		Above 20	0 - 5	309	.214	.600	90	.28
			6 - 10	490 [*]	.156	.016	92	06
			11 - 15	320	.152	.218	74	.10
			16 - 20	224	.152	.581	64	.19
	Dunnett C	0 - 5	6 - 10	181	.184		72	.36
			11 - 15	011	.190		56	.54
			16 - 20	.085	.187		46	.63
			Above 20	.309	.204		28	.90
		6 - 10	0 - 5	.181	.184		36	.72

Table 18. Post-hoc tests of ANOVA Analysis for Years of Teaching Experience and Attitudes for the 3^{rd} , 4^{th} and 8^{th} items

			11 - 15	.170	.143		23	.57
			16 - 20	.266	.139		12	.66
			Above 20	.490 [*]	.161		.04	.94
		11 - 15	0 - 5	.011	.190		54	.56
			6 - 10	170	.143		57	.23
			16 - 20	.096	.147		32	.51
			Above 20	.320	.168		15	.79
		16 - 20	0 - 5	085	.187		63	.46
			6 - 10	266	.139		66	.12
			11 - 15	096	.147		51	.32
			Above 20	.224	.165		24	.69
		Above 20	0 - 5	309	.204		90	.28
			6 - 10	490 [*]	.161		94	04
			11 - 15	320	.168		79	.15
			16 - 20	224	.165		69	.24
Attitude4	Tukey	0 - 5	6 - 10	312	.217	.606	91	.28
	HSD		11 - 15	051	.214	.999	64	.54
	e		16 - 20	129	.214	.975	72	.46
			Above 20	.160	.212	.943	42	.74
		6 - 10	0 - 5	.312	.217	.606	28	.91
			11 - 15	.260	.157	.463	17	.69
			16 - 20	.183	.158	.774	25	.62
			Above 20	.472 [*]	.154	.020	.05	.89
		11 - 15	0 - 5	.051	.214	.999	54	.64
			6 - 10	260	.157	.463	69	.17
			16 - 20	077	.154	.987	50	.34
			Above 20	.211	.150	.622	20	.62
		16 - 20	0 - 5	.129	.214	.975	46	.72
			6 - 10	183	.158	.774	62	.25
			11 - 15	.077	.154	.987	34	.50
			Above 20	.289	.151	.310	12	.70
		Above 20	0 - 5	160	.212	.943	74	.42
			6 - 10	472 [*]	.154	.020	89	05
			11 - 15	211	.150	.622	62	.20
			16 - 20	289	.151	.310	70	.12
	Dunnett C	0 - 5	6 - 10	312	.232		99	.37
			11 - 15	051	.241		75	.65
			16 - 20	129	.231		81	.55
			Above 20	.160	.245		55	.87
		6 - 10	0 - 5	.312	.232		37	.99
			11 - 15	.260	.146		15	.67
			16 - 20	.183	.129		18	.55

			Above 20	.472 [*]	.153		.04	.90
		11 - 15	0 - 5	.051	.241		65	.75
			6 - 10	260	.146		67	.15
			16 - 20	077	.145		48	.33
			Above 20	.211	.166		25	.68
		16 - 20	0 - 5	.129	.231		55	.81
			6 - 10	183	.129		55	.18
			11 - 15	.077	.145		33	.48
			Above 20	.289	.152		14	.71
		Above 20	0 - 5	160	.245		87	.55
			6 - 10	472 [*]	.153		90	04
			11 - 15	211	.166		68	.25
			16 - 20	289	.152		71	.14
Attitude8	Tukey	0 - 5	6 - 10	216	.163	.674	66	.23
	1130		11 - 15	104	.161	.968	54	.34
			16 - 20	.002	.161	1.000	44	.44
			Above 20	.151	.159	.876	29	.59
		6 - 10	0 - 5	.216	.163	.674	23	.66
			11 - 15	.113	.118	.875	21	.44
			16 - 20	.218	.118	.351	11	.54
			Above 20	.368 [*]	.116	.014	.05	.69
		11 - 15	0 - 5	.104	.161	.968	34	.54
			6 - 10	113	.118	.875	44	.21
			16 - 20	.105	.115	.891	21	.42
			Above 20	.255	.113	.159	05	.56
		16 - 20	0 - 5	002	.161	1.000	44	.44
			6 - 10	218	.118	.351	54	.11
			11 - 15	105	.115	.891	42	.21
			Above 20	.150	.113	.677	16	.46
		Above 20	0 - 5	151	.159	.876	59	.29
			6 - 10	368 [*]	.116	.014	69	05
			11 - 15	255	.113	.159	56	.05
			16 - 20	150	.113	.677	46	.16
	Dunnett C	0 - 5	6 - 10	216	.140		63	.20
			11 - 15	104	.147		53	.33
			16 - 20	.002	.161		47	.47
			Above 20	.151	.167		33	.63
		6 - 10	0 - 5	.216	.140		20	.63
			11 - 15	.113	.079		11	.33
			16 - 20	.218	.104		07	.51
			Above 20	,368 [*]	,112		,05	,68
		11 - 15	0 - 5	,104	,147		-,33	,53

			6 - 10	-,113	,079		-,33	,11	
			16 - 20	,105	,113		-,21	,42	
			Above 20	,255	,120		-,08	,59	
		16 - 20	0 - 5	-,002	,161		-,47	,47	
			6 - 10	-,218	,104		-,51	,07	
			11 - 15	-,105	,113		-,42	,21	
			Above 20	,150	,138		-,24	,53	
		Above 20	0 - 5	-,151	,167		-,63	,33	
			6 - 10	-,368 [*]	,112		-,68	-,05	
			11 - 15	-,255	,120		-,59	,08	
			16 - 20	-,150	,138		-,53	,24	
*. The me	'. The mean difference is significant at the 0.05 level.								

Secondly, Levene's test for homogeneity of variance for Attitude 4 is not significant (p = 0.109) as shown in Table 17, so we fail to reject the null hypothesis that the groups have equal variances therefore the results of the Dunnett C test should be ignored and the results of Tukey HSD test which requires the population variances to be equal must be used. When we look at Tukey HSD row in Attitude 4 at Table 18, it can be seen that there is only one statistically significant difference (p = 0.020) between pairs '6-10' and 'Above 20'. Therefore the results of Tukey HSD test show that there is a statistically significant difference in Attitude 4 between the instructors with a teaching experience of 6-10 years and the instructors with a teaching experience of more than 20 years. When we look at the mean difference values in Table 18, the mean difference between '6-10' and 'Above 20' for Attitude 4 is positive (0.472) which indicates that the instructors with a teaching experience of 6-10 years appear to think more positively that *'the students will be more interested in the courses that are implemented with ICT*' than the instructors with a teaching experience of more than 20 years.

Thirdly, Levene's test for homogeneity of variance for Attitude 8 is also significant (p = 0.000) as shown in Table 17, so we again reject the null hypothesis

that the groups have equal variances. Therefore the results of Dunnett C test which assumes the variances are not equal should be used. When we look at the Dunnett C part in Attitude 8 at Table 18, it can be seen that there is again only one statistically significant difference between pairs '6-10' and 'Above 20' (An asterisk in Mean Difference column indicates which pairwise comparisons are significant at the 0.05 significance level when using Dunnett C test). Therefore the results of Dunnett C test show that there is a statistically significant difference in Attitude 8 between the instructors with a teaching experience of '6-10' years and the instructors with a teaching experience of more than 20 years. When we look at the mean difference values in Table 18, the mean difference between '6-10' and 'Above 20' for Attitude 3 is positive (0.368) which indicates that the instructors with a teaching experience of 6-10 years appear to think more positively that '*the use of audio and visual tools is useful in my classes*' than the instructors with a teaching experience of more than 20 years.

Lastly, no statistically significant differences in the other attitudes between the instructors with different years of teaching experience were detected. The detailed results of this analyses can be seen in Table 3 in the Appendix B.

<u>4. Test of Difference in Attitudes towards ICT in Education between 'Academic Rank' Groups</u>

One-way ANOVA test was applied to academic rank of the respondents and every single item in the last part of the questionnaire. The results of the one-way ANOVA analysis in Table 20 show that there is no statistically significant difference in attitudes towards ICT between instructors who are grouped according to their academic ranks ('Professor', 'Associate Professor' and 'Assistant Professor'). The more detailed results of this analysis can be found in Table 4 in the Appendix B. In addition, the effect size values (Cohen's f^2) were calculated to find the practical significance of the test. Cohen's f^2 values can be seen in Table 19. Cohen argued that f^2 values of 0.02, 0.15 and 0.35 represent small, medium and large effect sizes respectively (Cohen, 1988). Therefore, Cohen's effect size values ($f^2 < 0.15$) in Table 19 suggest low practical significance.

Kalik	
Attitude1 * AcademicRank	.0024
Attitude2 * AcademicRank	.0053
Attitude3 * AcademicRank	.0051
Attitude4 * AcademicRank	.0049
Attitude5 * AcademicRank	.0004
Attitude6 * AcademicRank	.0101
Attitude7 * AcademicRank	.0060
Attitude8 * AcademicRank	.0085
Attitude9 * AcademicRank	.0026
Attitude10 * AcademicRank	.0012
Attitude11 * AcademicRank	.0025
Attitude12 * AcademicRank	.0027
Attitude13 * AcademicRank	.0068
Attitude14 * AcademicRank	.0184
Attitude15 * AcademicRank	.0030

Table 19. Effect Size Values (Cohen's f^2) for Attitudes towards ICT by Academic Rank

The findings of this study regarding the relationship between academic rank and attitudes towards ICT are consistent with the limited number of research studies in the literature. Similar to this study, Senaidi, Lin & Poirot (2009) investigated the instructors' perceived barriers to adopting ICT in Omani higher educational institutions. No differences between groups based on academic rank were found. According to the results their study, all faculty members in different academic ranks had similar views and attitudes about adopting ICT in their teaching practices. Another study which examined faculty members' attitudes towards technology and distance education in United States found no differences in attitudes with respect to participants' academic ranks (Tabata & Johnsrud, 2008).

		Sum of	đf	Mean	Б	Sig
		Squares	ui	Square	1	Sig.
Attitude 1	Between Groups	.351	2	.175	.358	.700
Attitude 2	Between Groups	2.917	2	1.459	.788	.456
Attitude 3	Between Groups	1.311	2	.656	.765	.466
Attitude 4	Between Groups	1.215	2	.608	.726	.485
Attitude 5	Between Groups	.100	2	.050	.056	.945
Attitude 6	Between Groups	5.578	2	2.789	1.508	.223
Attitude 7	Between Groups	1.651	2	.825	.895	.410
Attitude 8	Between Groups	1.202	2	.601	1.275	.281
Attitude 9	Between Groups	.404	2	.202	.382	.683
Attitude 10	Between Groups	.554	2	.277	.181	.834
Attitude 11	Between Groups	.684	2	.342	.367	.693
Attitude 12	Between Groups	.839	2	.419	.404	.668
Attitude 13	Between Groups	1.634	2	.817	1.018	.363
Attitude 14	Between Groups	7.603	2	3.801	2.744	.066
Attitude 15	Between Groups	1.500	2	.750	.441	.644

Table 20. One-way ANOVA: Attitudes towards ICT by Academic Rank

5. Test of Difference in Attitudes towards ICT in Education between 'Academic Discipline' Groups

The sample sizes of the instructors who are grouped according to their academic disciplines are shown in Table 21. As it can be seen from Table 21, there are large differences in the sample sizes among groups. For instance, only five instructors from Law and five instructors from Arts responded to the questionnaire while there are sixty five respondents from Social Sciences. This violates the assumption of the equality of population variances for one-way ANOVA (Green & Salking, 2005) and makes the overall test untrustworthy. So it was decided not to evaluate the effect of Academic Discipline factor on the instructors' attitudes towards ICT in this study. However, the effect size values (Cohen's f^2) were calculated to find the practical significance and the results can be seen in Table 22. Cohen's effect size values ($f^2 < 0.15$) in Table 22 suggest low practical significance (Cohen, 1988).

	Frequency	Percentage (%)
Educational Sci.	41	14
Natural Sci Math	58	19
Engineering	53	17
Law	5	2
Architecture	10	3
Religious Studies	14	5
Philology	12	4
Medical Sciences	24	8
Social Sciences	65	21
Agriculture Sci.	15	5
Arts	5	2
Total	302	100

Table 21. Sample sizes of 'Academic Discipline' groups

Attitude1 * AcademicField	.0518
Attitude2 * AcademicField	.0246
Attitude3 * AcademicField	.0439
Attitude4 * AcademicField	.0591
Attitude5 * AcademicField	.0610
Attitude6 * AcademicField	.0887
Attitude7 * AcademicField	.0326
Attitude8 * AcademicField	.0600
Attitude9 * AcademicField	.0334
Attitude10 * AcademicField	.0271
Attitude11 * AcademicField	.0482
Attitude12 * AcademicField	.0351
Attitude13 * AcademicField	.0301
Attitude14 * AcademicField	.0276
Attitude15 * AcademicField	.0351

Table 22. Effect Size Values (Cohen's f^2) for Attitudes towards ICT by Academic Field

<u>6. Test of Difference in Attitudes towards ICT in Education between 'Geographic</u> <u>Area' Groups</u>

One-way ANOVA test was applied to geographic areas in which the respondents reside and every single item in the last part of the questionnaire. The results of the one-way ANOVA analysis in Table 24 show that there is no statistically significant difference in attitudes towards ICT between instructors who are grouped according to their locations of current occupation in terms of geographic area. The more detailed results of this analysis can be found in Table 5 in the Appendix B.

In addition, the effect size values (Cohen's f^2) were calculated to find the practical significance of the test. Cohen's f^2 values can be seen in Table 23. Cohen argued that f^2 values of 0.02, 0.15 and 0.35 represent small, medium and large effect sizes respectively (Cohen, 1988). Therefore, Cohen's effect size values ($f^2 < 0.15$) in Table 23 suggest low practical significance.

Inca	
Attitude1 * GeographicArea	.0399
Attitude2 * GeographicArea	.0328
Attitude3 * GeographicArea	.0830
Attitude4 * GeographicArea	.0485
Attitude5 * GeographicArea	.0482
Attitude6 * GeographicArea	.1297
Attitude7 * GeographicArea	.1157
Attitude8 * GeographicArea	.0491
Attitude9 * GeographicArea	.0592
Attitude10 * GeographicArea	.0586
Attitude11 * GeographicArea	.0744
Attitude12 * GeographicArea	.0980
Attitude13 * GeographicArea	.0840
Attitude14 * GeographicArea	.0174
Attitude15 * GeographicArea	.1419

Table 23. Effect Size Values (Cohen's f^2) for Attitudes towards ICT by Geographic Area

In the literature, there was not any study that investigates the relationship between the attitude of the teacher towards ICT and geographic location of the teacher. When designing this study, it was thought that the geographic location of the teacher might have an effect on teacher's attitude towards ICT because there are big socioeconomic differences between geographic areas of Turkey (Gezici & Hewings, 2004). In economically under-developed regions of Turkey, teachers may not have the necessary ICT tools in their classrooms or students may not have the necessary ICT tools and skills to be able to follow teachers' ICT-based classes and according to the author, these may effectively influence the teachers' attitude towards the use of ICT in education. One might also expect that instructors working in economically developed regions such as Marmara or Aegean may have more favorable attitudes towards ICT because of several factors such as easy access to technology and training courses, long-established background of higher education institutions and so on. However, this study found no statistically significant differences in attitudes towards ICT between instructors who are grouped according to seven geographic areas of Turkey. Thus, it can be concluded that the attitudes of instructors who reside in different geographic areas of Turkey are not very different in terms of using ICT in education.

		Sum of	df	Mean	F	Sig
		Squares	ui	Square	Г	51g.
Attitude 1	Between Groups	7.243	6	.724	1.507	.136
Attitude 2	Between Groups	13.382	6	1.338	.717	.708
Attitude 3	Between Groups	10.827	6	1.083	1.277	.243
Attitude 4	Between Groups	14.019	6	1.402	1.719	.076
Attitude 5	Between Groups	15.335	6	1.534	1.776	.064
Attitude 6	Between Groups	45.506	6	4.551	2.581	.055
Attitude 7	Between Groups	8.744	6	.874	.948	.490
Attitude 8	Between Groups	8.050	6	.805	1.746	.070
Attitude 9	Between Groups	5.118	6	.512	.971	.469
Attitude 10	Between Groups	12.056	6	1.206	.788	.641
Attitude 11	Between Groups	12.837	6	1.284	1.402	.179
Attitude 12	Between Groups	10.549	6	1.055	1.021	.425
Attitude 13	Between Groups	7.062	6	.706	.877	.556
Attitude 14	Between Groups	11.309	6	1.131	.802	.627
Attitude 15	Between Groups	17.288	6	1.729	1.022	.424

Table 24. One-way ANOVA: Attitudes towards ICT by Geographic Area

CHAPTER 6

CONCLUSION

Conclusion and Discussion

Firstly, this study aimed to find the general attitudes of the instructors towards the use of ICT in education. Total means and standart deviations were calculated for each statement in the attitude scale of the questionnaire to determine the attitudes of the university instructors regarding the educational use of ICT. The scores of the means in Table 9 show that instructors in higher education across Turkey have a favorable attitude towards the use of ICT in their classrooms (overall mean of all items: 4.12). The instructors agreed with nine positively worded statements (overall mean of positive items: 4.33) about the use of ICT in teaching and learning (e.g. 'I believe that ICT enhances the motivation of the students', 'I believe that ICT support facilitates the learning'). They disagreed with four of the six negative statements (overall mean of these four statements: 4.37) about the use of ICT in teaching and learning (e.g. 'I think it is a waste of time to use ICT tools in the courses.', 'I think ICT restricts the creativity of the teachers.'). However, they did not completely disagree with the following two negative statements: 'The usage of ICT in the courses brings too much overload.' (M: 2.74) and 'I think that it is difficult to use ICT in the courses.' (M: 2.55). This reveals that although the instructors have a favorable attitude towards the use of ICT in education and they believe that the use of ICT is useful for their teaching and instruction, they still think that the use of ICT in their classes is difficult and brings too much overload. This can be interpreted that although the university instructors are highly educated people who know and

appreciate the potential benefits and advantages of using ICT in their teaching activities, most of them may not have the necessary knowledge and IT skills to be able to use and integrate ICT into their teaching activities which leads them to think the use of ICT is difficult in the classes.

This study also aimed to explore any differences in attitudes towards ICT between instructors who are grouped according to six different independent demographic variables which include gender, age, years of teaching experience, academic rank, academic discipline and location of current occupation in terms of geographic area. Independent sample t-test and one-way ANOVA were conducted to find the differences in attitudes. Effect size values were also calculated to find the practical significance of the tests.

The findings of this study showed that there is no statistically significant difference between the instructors' attitudes towards the use of ICT in education with respect to gender. Further, Cohen's effect size values (d < 0.5) suggested low practical significance. The result may indicate that male and female instructors in higher education institutions in Turkey have the similar beliefs and attitudes about the use of ICT in education. Previous research reported conflicting results in terms of the relationship between gender and instructors' attitudes towards ICT. While some studies show that there is a gender difference in attitudes towards ICT (Rozell & Gardner, 2000; Hong et al., 2002; Shapkaa & Ferrari, 2003; Garland & Noyes, 2004), other studies report little or no differences in instructor attitudes on the basis of gender (Kramer & Lehman; 1990; Whitley, 1997; Koszalka, 2001). In this study, there has been found no differences in the attitudes between the instructors of different genders however the question about the relationship of gender with attitudes towards ICT requires further research with other samples and high response rates.

The findings of this study also showed that there is no statistically significant difference between instructors' attitudes towards the use of ICT in education in terms of age. Further, Cohen's effect size values ($f^2 < 0.15$) suggested low practical significance. In the literature, there are different findings in terms of teachers' attitudes towards ICT and teachers' age. For instance, while some studies indicated that there is no significant difference between teachers with different ages in terms of their attitudes (Massoud, 1991; Woodrow, 1992; Handler, 1993), other studies found that teachers' ages have a significant effect on attitudes towards ICT (Chio, 1992; Blankenship, 1998; Jennings & Onwuegbuzie, 2001; Adams, 2002; Wagner, Hassanein & Head, 2010). Similar to the gender issue, the relationship between age and attitudes towards ICT necessitates further research with other samples and high response rates.

For the years of teaching experience, the data showed that there is a statistically significant difference in some attitudes towards the use of ICT tools in education between the instructors with a teaching experience of 6-10 years and the instructors with a teaching experience of more than 20 years. The instructors with a teaching experience of 6-10 years seem to think more positively that '*the usage of ICT improves the instructor's performance*' than the instructors with a teaching experience of 6-10 years. The data also showed that instructors with a teaching experience of 6-10 years appear to think more positively that '*the students will be more interested in the courses that are implemented with ICT*' than the instructors with a teaching experience of 6-10 years think more positively that '*the use of audio and visual tools is useful in my classes*' than the instructors with a teaching experience of more than 20 years.

attitudes between the instructors with different years of teaching experience were detected. Further, Cohen's effect size values ($f^2 < 0.15$) suggested low practical significance. In the literature, there are different findings in terms of teachers' attitudes and years of teaching experience. According to a research conducted by the US National Center for Educational Statistics (2006) indicated that teachers with less years of experience use ICT more for educational purposes. However, Niederhauser et al. (2001) has found no differences in attitudes with respect to the years of teaching experience.

In the fourth question of the demographic part of the survey, the participants' academic ranks (Professor, Associate Professor, Assistant Professor) were asked to find whether there is a statistically significant difference between instructors with different academic ranks in terms of their attitudes towards ICT. It has been found that there is no statistically significant difference between instructors with different academic ranks in terms of their attitudes towards ICT. Further, Cohen's effect size values ($f^2 < 0.15$) suggested low practical significance. The findings of this study are consistent with the limited number of research studies in the literature. Senaidi et al. (2009) investigated the instructors' perceived barriers to adopting ICT in Omani higher educational institutions. No differences between groups based on academic rank were found. According to the results their study, all faculty members in different academic ranks had similar views and attitudes about adopting ICT in their teaching practices. Another study which examined faculty members' attitudes towards technology and distance education in United States found no differences in attitudes with respect to participants' academic ranks (Tabata & Johnsrud, 2008). There are large differences in the sample sizes of the instructors who are grouped according to their academic disciplines which violates the assumption of the equality

of population variances for one-way ANOVA (Green & Salking, 2005) and makes the overall test untrustworthy. Because of this reason, it was decided not to analyze the effect of 'academic discipline' factor on the instructors' attitudes towards ICT in this study. However, the effect size values (Cohen's f^2) were calculated to find the practical significance. Cohen's effect size values ($f^2 < 0.15$) suggested low practical significance.

Lastly, this study aimed to investigate whether location of university affects the attitude of the instructors towards ICT. The last question in the demographic part of the questionnaire asked what is the current location of participant's occupation in terms of seven geographic areas of Turkey. It was hypothesized that the geographic location of the teacher might have an effect on teacher's attitude towards ICT because there are big socio-economic differences between geographic areas of Turkey (Gezici & Hewings, 2004). In economically under-developed regions of Turkey, teachers may not have the necessary ICT tools in their classrooms or students may not have the necessary ICT tools and skills to be able to follow teachers' ICT-based classes and according to the author, these may effectively influence the teachers' attitude towards the use of ICT in education. One might also expect that instructors working in economically developed regions such as Marmara or Aegean may have more favorable attitudes towards ICT because of several factors such as easy access to technology and training courses, long-established background of higher education institutions and so on. However, this study found no statistically significant differences in attitudes towards ICT between instructors who are grouped according to seven geographic areas of Turkey. Thus, it can be concluded that the attitudes of instructors who reside in different geographic areas of Turkey are not very different in terms of using ICT in education. Further, Cohen's effect size values

 $(f^2 < 0.15)$ also suggested low practical significance.

The instructors' technical experiences and skills in using ICT in their personal and professional lives can also be discussed. The Technical Experience and Skills part of the questionnaire aimed to find the instructors' overall level of exposure to technology and their frequencies of using technology. The data from this part of the survey reveals that most of the instructors in higher education institutions have high level of professional experience with ICT tools in education. Most of the instructors (96%) have their personal computers in their homes and the majority (91%) has the internet access at their homes. 95% of the respondents reported that they can use at least one of the MS Office software very well. 80% of the respondents say that they can prepare electronic course materials with their computers and 63% of them share their course materials electronically with their students. These figures clearly indicate that most of the respondents are already exposed to computers and technology. These figures also show us that most of the respondents are already using ICT tools in their classrooms. However, only 29% of the respondents has a web-site for at least one of their courses and 16% have thought via internet. In addition, only 22% of the respondents have used online learning management systems such as Moodle. These figures are very low and can be considered as an obstacle for the instructors to fully embrace the advantages of using ICT in their teaching practices.

Limitations and Suggestions

There are several limitations of this study; these limitations might suggest some directions for the future research.

First of all, in theory e-mails which include the questionnaire were sent to all the instructors from twenty one different universities across Turkey. However, some of the instructors were not reached via e-mail. The e-mails of the instructors have been taken from the department web-sites however some of the department web-sites were not up to date so they did not have the current list of instructors. In addition, some of the instructors' e-mail addresses were also not up to date in these department web sites because after the e-mails were sent to instructors, some automatic replies have been received saying that the corresponding e-mail address is not being used anymore. So it can be said that some of the instructors from twenty one universities have not received the e-mail which includes the questionnaire. This problem can be solved if it is contacted with secretaries of departments and it can be requested the up to date list of current instructors in the department and their working e-mail addresses.

Secondly, the response rate of the survey was very low (5.35%), which raises generalizability issues. It is possible that the most technology savvy instructors might have responded to the survey. Because no data is available on the non-responders, it is also not possible to characterize them or identify possible causes of bias. Hence, no claims of generalization to all instructors in the country, or even the universities that the data were collected can be made. The results only describe and explain the attitudes of the participants in this study. Therefore, it is advisable to replicate the survey with a greater response rate.

Thirdly, the instrument used in this study only serves as a starting point. No factor analysis was conducted to explore possible attitude clusters, hence the attitudes were not named. There is a need to develop valid and reliable measures of attitudes towards using ICT in education. Further research to determine dimensions of the attitudes towards the use of ICT in education may prove useful in understanding these attitudes.

Lastly, this study was based on a survey design. The participants only indicated their level of agreement with closed ended statements. It is possible that these statements may not be adequate, complete, or even misguiding. Research using open ended and qualitative methods may help capture instructors' attitudes and their meaning more deeply and accurately.
APPENDICES

APPENDIX A

Questionnaire

Survey About Instructors' Attitudes Towards the Use of Information and Communication Technologies in Education

This questionnaire is being conducted by Osman Akşit who is a master student in Information Management Systems department at Boğaziçi University. This questionnaire will be used for the master thesis which has a topic as "INVESTIGATING THE INSTRUCTORS' ATTITUDES TOWARDS THE USE OF INFORMATION AND COMMUNICATION TECHNOLOGIES (ICT) IN HIGHER EDUCATION" with consultation of Prof. Dr. Birgül Kutlu Bayraktar. It will take approximately 10 minutes to answer this questionnaire. Your answers will be completely anonymous. Thank you for taking your time.

Part 1 : Demographic Information Part

* Required

	1. Gender *
0	Male
0	Female

	2. Age *
С	Under 36
С	36 - 49
С	Above 49

3. Teaching Experience * 0 - 5 years 6 - 10 years 11 - 15 years 16 - 20 years Above 21 years

4. Academic Rank *

0	Professor
0	Associate Professor
0	Assistant Professor

5. Academic Discipline *

0	Educational Sciences
0	Natural Sciences and Mathematics
0	Engineering
0	Law
0	Architecture
0	Religious Studies
0	Philology
0	Medical Sciences
0	Social Sciences
0	Agriculture Sciences
0	Arts

6. Geographic Area *

0	Marmara
0	Aegean
0	Central Anatolia
0	Mediterranean
0	Black Sea
0	Eastern Anatolia
0	Southeastern Anatolia

Part 2 : Technical Experience and Skills Part

* Required

1. Do you have a computer in your home? * Yes No

2. Do you have the internet connection in your home? *

0	Yes	
0	No	

3. Do you use smart phone? *

0	Yes	
0	No	

4. How many hours do you use the internet in a day? *

0	Less than 1 hour
0	Between 1 and 5 hours
0	More than 5 hours

5. Can you use at least one of the Microsoft Office programs such as Word, Excel or Power point very well? *

0	Yes	
0	No	

6. Can you solve any problem that you encounter when you are using your computer? *

0	Yes	
0	No	

7. Can you prepare electronic course materials using various software with your computer? *

0	Yes
0	No

8. Do you share your course materials electronically with your students? *

0	Yes
0	No

9. Do you have a web-site for at least one of your courses? *

0	Yes
0	No

10. Have you ever taught via internet? *

0	Yes
0	No

11. Do you use online discussion forums for educational purposes? *

0	Yes
0	No

12. Do you use online learning management systems such as Moodle? *

0	Yes	
0	No	

Part 3 : Attitudes towards ICT in Education Part

* Required

Please comment on all questions by choosing one of the options between 1 and 5.

Strongly Disagree
 Disagree
 Neutral
 Agree
 Strongly Agree

1. I believe that the usage of ICT is important in achieving the aims of curriculum. * Ō. O Strongly Disagree O Strongly Agree 2. The usage of ICT in the courses brings too much overload. * Strongly Disagree O Strongly Agree 3. I think that the usage of ICT improves the teacher's performance. * Ō. Ō Strongly Disagree O Strongly Agree 4. I believe that the students will be more interested in the courses that are implemented with ICT. * \mathbf{O} Strongly Disagree O Strongly Agree 5. It is luxurious to use ICT in schools in our country. * Strongly Disagree O Strongly Agree 6. I think that it is difficult to use ICT in the courses. * Strongly Disagree O Ō O Strongly Agree 7. I believe that ICT support facilitates the learning. * \odot Strongly Disagree O Strongly Agree

8. I believe that us	ing a	udio a	and vi	isual t	tools i	in my classes is usef	ul.*	
	1	2	3	4	5			
Strongly Disagree	0	0	0	0	0	Strongly Agree		
9. I think that the u	isage	of IC	CT in	the co	ourses	will improve the stu	idents' success	*
	1	2	3	4	5			
Strongly Disagree	0	0	0	0	0	Strongly Agree		
10. I think ICT is a	a rive	ıl to te	eacher	rs. *				
	1	2	3	4	5			
Strongly Disagree	0	0	0	0	0	Strongly Agree		
11 I haliawa that a	udia		1 + 0 0 1	a anh	0000	the learning norman	*	
11. I deneve that a	<u>uaio</u> 1	-visua			ance	the learning permane	ence.	
	1	L	3	4	3			
Strongly Disagree	0	0	0	0	0	Strongly Agree		
12. I think that IC	Γ res ¹	tricts	the cr	eativi	ty of	the teachers. *		
	1	2	3	4	5			
Strongly Disagree	0	0	0	0	0	Strongly Agree		
10 14114 4141			с.:		TOP	D (1 • (1	ب	
13. I think that it is	3 a w	aste o	of time	e to us	se IC.	tools in the courses	•	
	1	2	3	4	3			
Strongly Disagree	0	0	0	0	0	Strongly Agree		
14 11 1 11 11 1	CT	1	.1		• ,•			
14. I believe that I		nnanc	es the	e mot	ivatio	n of the students. *		
	1	2	3	4	5			
Strongly Disagree	0	0	0	0	0	Strongly Agree		
15. I think that the teacher. *	effic	cient u	isage	of IC	T is o	ne of the requiremer	nts for being a g	good
	1	2	3	4	5			
Strongly Disagree	0	0	0	0	0	Strongly Agree		

APPENDIX B

Outputs Of Findings Of The Difference Tests

Table 1. Independent sample t-test: Attitudes towards ICT by Gender

	Independent Samples Test										
		Leven for Eq Vari	e's Test uality of ances		t-test for Equality of Means						
						Sig. (2-	Mean	Std Error	95% Cor Interva Differ	nfidence I of the rence	
		F	Sig.	t	df	tailed)	Difference	Difference	Lower	Upper	
Attitude1	Equal variances assumed	.030	.863	160	300	.873	014	.084	179	.152	
	Equal variances not assumed			159	213.555	.874	014	.085	181	.154	
Attitude2	Equal variances assumed	.086	.769	.531	300	.596	.087	.164	235	.409	
	Equal variances not assumed			.532	219.201	.595	.087	.164	235	.409	
Attitude3	Equal variances assumed	1.334	.249	128	300	.898	014	.111	234	.205	
	Equal variances not assumed			125	205.415	.900	014	.114	239	.210	
Attitude4	Equal variances assumed	.181	.671	360	300	.719	040	.110	256	.177	
	Equal variances not assumed			355	211.211	.723	040	.111	259	.180	
Attitude5	Equal variances assumed	1.223	.270	1.858	300	.064	.210	.113	012	.431	
	Equal variances not assumed			1.851	215.700	.066	.210	.113	014	.433	
Attitude6	Equal variances assumed	.504	.478	250	300	.803	041	.164	364	.282	
	Equal variances not assumed			248	213.509	.805	041	.165	367	.285	
Attitude7	Equal variances assumed	.013	.908	288	300	.774	033	.116	261	.194	
	Equal variances not assumed			295	233.622	.768	033	.113	256	.189	
Attitude8	Equal variances assumed	5.201	.023	- 1.729	300	.085	143	.082	305	.020	
	Equal variances not assumed			- 1.792	241.741	.074	143	.080	299	.014	
Attitude9	Equal variances assumed	.062	.804	576	300	.565	050	.087	222	.122	
	Equal variances not assumed			558	199.374	.577	050	.090	228	.127	
Attitude10	Equal variances assumed	.061	.805	501	300	.617	074	.148	367	.218	
	Equal variances not assumed			506	225.112	.613	074	.147	364	.215	

Attitude11	Equal variances assumed	2.250	.135	- 1.592	300	.112	184	.116	411	.043
	Equal variances not assumed			- 1.627	232.490	.105	184	.113	407	.039
Attitude12	Equal variances assumed	.381	.537	631	300	.528	077	.122	318	.164
	Equal variances not assumed			615	202.320	.539	077	.126	325	.170
Attitude13	Equal variances assumed	.754	.386	- 1.325	300	.186	143	.108	354	.069
	Equal variances not assumed			- 1.336	223.373	.183	143	.107	353	.068
Attitude14	Equal variances assumed	.046	.829	- 1.140	300	.255	162	.142	442	.118
	Equal variances not assumed			- 1.144	220.689	.254	162	.142	442	.117
Attitude15	Equal variances assumed	.038	.846	.100	300	.921	.016	.157	293	.324
	Equal variances not assumed			.100	221.652	.920	.016	.156	292	.323

Table 2. One-way ANOVA: Attitudes towards ICT by Age

		AN	IOVA			
		Sum of Squares	df	Mean Square	F	Sig.
Attitude1	Between Groups	.507	2	.254	.517	.597
	Within Groups	146.579	299	.490		
	Total	147.086	301			
Attitude2	Between Groups	1.395	2	.698	.376	.687
	Within Groups	554.939	299	1.856		
	Total	556.334	301			
Attitude3	Between Groups	2.296	2	1.148	1.345	.262
	Within Groups	255.187	299	.853		
	Total	257.483	301			
Attitude4	Between Groups	1.363	2	.682	.815	.444
	Within Groups	250.014	299	.836		
	Total	251.377	301			
Attitude5	Between Groups	2.546	2	1.273	1.442	.238
	Within Groups	263.997	299	.883		
	Total	266.543	301			
Attitude6	Between Groups	1.781	2	.891	.478	.620
	Within Groups	556.871	299	1.862		
	Total	558.652	301			
Attitude7	Between Groups	1.027	2	.514	.556	.574
	Within Groups	276.248	299	.924		
	Total	277.275	301			

Attitude8	Between Groups	1.282	2	.641	1.360	.258
	Within Groups	140.903	299	.471		
	Total	142.185	301			
Attitude9	Between Groups	.277	2	.138	.261	.770
	Within Groups	158.266	299	.529		
	Total	158.543	301			
Attitude10	Between Groups	1.168	2	.584	.383	.682
	Within Groups	456.187	299	1.526		
	Total	457.354	301			
Attitude11	Between Groups	.630	2	.315	.338	.714
	Within Groups	278.632	299	.932		
	Total	279.262	301			
Attitude12	Between Groups	.557	2	.279	.268	.765
	Within Groups	310.559	299	1.039		
	Total	311.116	301			
Attitude13	Between Groups	2.621	2	1.311	1.641	.196
	Within Groups	238.875	299	.799		
	Total	241.497	301			
Attitude14	Between Groups	5.498	2	2.749	1.974	.141
	Within Groups	416.264	299	1.392		
	Total	421.762	301			
Attitude15	Between Groups	1.276	2	.638	.375	.687
	Within Groups	508.128	299	1.699		
	Total	509.404	301			

Table 3. One-way ANOVA: Attitudes towards ICT by Teaching Experience

ANOVA										
		Sum of Squares	df	Mean Square	F	Sig.				
Attitude1	Between Groups	1.164	4	.291	.592	.668				
	Within Groups	145.922	297	.491						
	Total	147.086	301							
Attitude2	Between Groups	11.641	4	2.910	1.587	.178				
	Within Groups	544.694	297	1.834						
	Total	556.334	301							
Attitude3	Between Groups	8.843	4	2.211	2.641	.034				
	Within Groups	248.640	297	.837						
	Total	257.483	301							

Attitude4	Between Groups	8.073	4	2.018	2.464	.045
	Within Groups	243.305	297	.819		
	Total	251.377	301			
Attitude5	Between Groups	2.391	4	.598	.672	.612
	Within Groups	264.152	297	.889		
	Total	266.543	301			
Attitude6	Between Groups	17.239	4	4.310	2.364	.053
	Within Groups	541.413	297	1.823		
	Total	558.652	301			
Attitude7	Between Groups	2.318	4	.579	.626	.644
	Within Groups	274.957	297	.926		
	Total	277.275	301			
Attitude8	Between Groups	5.155	4	1.289	2.793	.027
	Within Groups	137.031	297	.461		
	Total	142.185	301			
Attitude9	Between Groups	2.338	4	.585	1.111	.351
	Within Groups	156.205	297	.526		
	Total	158.543	301			
Attitude10	Between Groups	3.870	4	.968	.634	.639
	Within Groups	453.484	297	1.527		
	Total	457.354	301			
Attitude11	Between Groups	1.029	4	.257	.275	.894
	Within Groups	278.232	297	.937		
	Total	279.262	301			
Attitude12	Between Groups	8.711	4	2.178	2.139	.076
	Within Groups	302.405	297	1.018		
	Total	311.116	301			
Attitude13	Between Groups	7.275	4	1.819	2.306	.058
	Within Groups	234.221	297	.789		
	Total	241.497	301			
Attitude14	Between Groups	3.376	4	.844	.599	.664
	Within Groups	418.386	297	1.409		
	Total	421.762	301			
Attitude15	Between Groups	5.251	4	1.313	.773	.543
	Within Groups	504.153	297	1.697		
	Total	509.404	301			

Table 3.1. Test of Homogeneity of Variances for one-way ANOVA: Attitudes

towards ICT by Teaching Experience

Test of Homogeneity of Variances									
	Levene Statistic	df1	df2	Sig.					
Attitude1	1.264	4	297	.284					
Attitude2	.953	4	297	.434					
Attitude3	2.457	4	297	.046					
Attitude4	1.906	4	297	.109					
Attitude5	1.776	4	297	.134					
Attitude6	1.573	4	297	.181					
Attitude7	.515	4	297	.725					
Attitude8	7.195	4	297	.000					
Attitude9	1.893	4	297	.112					
Attitude10	1.702	4	297	.150					
Attitude11	.892	4	297	.469					
Attitude12	1.270	4	297	.282					
Attitude13	4.818	4	297	.001					
Attitude14	.578	4	297	.679					
Attitude15	1.035	4	297	.389					

Table 3.2. Post-hoc Comparison Tests for one-way ANOVA: Attitudes towards ICT

by Teaching Experience

Multiple Comparisons														
			Mean			95% Cor Inte	nfidence rval							
Dependent Variable			Difference (I-J)	Std. Error	Sig.	Lower Bound	Upper Bound							
Attitude3	Tukey	0 - 5	6 - 10	181	,219	,924	-,78	,42						
	130				11 - 15	011	,216	1,000	-,60	,58				
					16 - 20	.085	,217	,995	-,51	,68				
			Above 20	.309	,214	,600	-,28	,90						
		6 - 10	0 - 5	.181	,219	,924	-,42	,78						
			11 - 15	.170	,159	,822	-,27	,61						
									16 - 20	.266	,159	,456	-,17	,70
			Above 20	.490 [*]	,156	,016	,06	,92						
		11 - 15	0 - 5	.011	,216	1,000	-,58	,60						
			6 - 10	170	,159	,822	-,61	,27						

			16 - 20	.096	,155	,972	-,33	,52
			Above 20	.320	,152	,218	-,10	,74
		16 - 20	0 - 5	085	,217	,995	-,68	,51
			6 - 10	266	,159	,456	-,70	,17
			11 - 15	096	,155	,972	-,52	,33
			Above 20	.224	,152	,581	-,19	,64
		Above 20	0 - 5	309	,214	,600	-,90	,28
			6 - 10	490 [*]	,156	,016	-,92	-,06
			11 - 15	320	,152	,218	-,74	,10
			16 - 20	224	,152	,581	-,64	,19
	Dunnett C	0 - 5	6 - 10	181	,184		-,72	,36
			11 - 15	011	,190		-,56	,54
			16 - 20	.085	,187		-,46	,63
			Above 20	.309	,204		-,28	,90
		6 - 10	0 - 5	.181	,184		-,36	,72
			11 - 15	.170	,143		-,23	,57
			16 - 20	.266	,139		-,12	,66
			Above 20	.490 [*]	,161		,04	,94
		11 - 15	0 - 5	.011	,190		-,54	,56
			6 - 10	170	,143		-,57	,23
			16 - 20	.096	,147		-,32	,51
			Above 20	.320	,168		-,15	,79
		16 - 20	0 - 5	085	,187		-,63	,46
			6 - 10	266	,139		-,66	,12
			11 - 15	096	,147		-,51	,32
			Above 20	.224	,165		-,24	,69
		Above 20	0 - 5	309	,204		-,90	,28
			6 - 10	490 [*]	,161		-,94	-,04
			11 - 15	320	,168		-,79	,15
			16 - 20	224	,165		-,69	,24
Attitude4	Tukey	0 - 5	6 - 10	312	,217	,606	-,91	,28
	1130		11 - 15	051	,214	,999	-,64	,54
			16 - 20	129	,214	,975	-,72	,46
			Above 20	.160	,212	,943	-,42	,74
		6 - 10	0 - 5	.312	,217	,606	-,28	,91
			11 - 15	.260	,157	,463	-,17	,69
			16 - 20	.183	,158	,774	-,25	,62
			Above 20	.472 [*]	,154	,020	,05	,89
		11 - 15	0 - 5	.051	,214	,999	-,54	,64
			6 - 10	260	,157	,463	-,69	,17
			16 - 20	077	,154	,987	-,50	,34
			Above 20	.211	,150	,622	-,20	,62

		16 - 20	0 - 5	.129	,214	,975	-,46	,72
			6 - 10	183	,158	,774	-,62	,25
			11 - 15	.077	,154	,987	-,34	,50
			Above 20	.289	,151	,310	-,12	,70
		Above 20	0 - 5	160	,212	,943	-,74	,42
			6 - 10	472 [*]	,154	,020	-,89	-,05
			11 - 15	211	,150	,622	-,62	,20
			16 - 20	289	,151	,310	-,70	,12
	Dunnett C	0 - 5	6 - 10	312	,232		-,99	,37
			11 - 15	051	,241		-,75	,65
			16 - 20	129	,231		-,81	,55
			Above 20	.160	,245		-,55	,87
		6 - 10	0 - 5	.312	,232		-,37	,99
			11 - 15	.260	,146		-,15	,67
			16 - 20	.183	,129		-,18	,55
			Above 20	.472 [*]	,153		,04	,90
		11 - 15	0 - 5	.051	,241		-,65	,75
			6 - 10	260	,146		-,67	,15
			16 - 20	077	,145		-,48	,33
			Above 20	.211	,166		-,25	,68
		16 - 20	0 - 5	.129	,231		-,55	,81
			6 - 10	183	,129		-,55	,18
			11 - 15	.077	,145		-,33	,48
			Above 20	.289	,152		-,14	,71
		Above 20	0 - 5	160	,245		-,87	,55
			6 - 10	472 [*]	,153		-,90	-,04
			11 - 15	211	,166		-,68	,25
			16 - 20	289	,152		-,71	,14
Attitude8	Tukey	0 - 5	6 - 10	216	,163	,674	-,66	,23
	130		11 - 15	104	,161	,968	-,54	,34
			16 - 20	.002	,161	1,000	-,44	,44
			Above 20	.151	,159	,876	-,29	,59
		6 - 10	0 - 5	.216	,163	,674	-,23	,66
			11 - 15	.113	,118	,875	-,21	,44
			16 - 20	.218	,118	,351	-,11	,54
			Above 20	.368 [*]	,116	,014	,05	,69
		11 - 15	0 - 5	.104	,161	,968	-,34	,54
			6 - 10	113	,118	,875	-,44	,21
			16 - 20	.105	,115	,891	-,21	,42
			Above 20	.255	,113	,159	-,05	,56
		16 - 20	0 - 5	002	,161	1,000	-,44	,44
			6 - 10	218	,118	,351	-,54	,11

			11 - 15	105	,115	,891	-,42	,21
			Above 20	.150	,113	,677	-,16	,46
		Above 20	0 - 5	151	,159	,876	-,59	,29
			6 - 10	368 [*]	,116	,014	-,69	-,05
			11 - 15	255	,113	,159	-,56	,05
			16 - 20	150	,113	,677	-,46	,16
	Dunnett C	0 - 5	6 - 10	216	,140		-,63	,20
			11 - 15	104	,147		-,53	,33
			16 - 20	.002	,161		-,47	,47
			Above 20	.151	,167		-,33	,63
		6 - 10	0 - 5	.216	,140		-,20	,63
		11 - 15	.113	,079		-,11	,33	
		16 - 20	.218	,104		-,07	,51	
		Above 20	.368 [*]	,112		,05	,68	
		11 - 15	0 - 5	.104	,147		-,33	,53
			6 - 10	113	,079		-,33	,11
			16 - 20	.105	,113		-,21	,42
			Above 20	.255	,120		-,08	,59
		16 - 20	0 - 5	002	,161		-,47	,47
			6 - 10	218	,104		-,51	,07
			11 - 15	105	,113		-,42	,21
			Above 20	.150	,138		-,24	,53
		Above 20	0 - 5	151	,167		-,63	,33
			6 - 10	368 [*]	,112		-,68	-,05
			11 - 15	255	,120		-,59	,08
			16 - 20	150	,138		-,53	,24
*. The me	an difference	e is significar	nt at the 0.05	level.				

Table 4. One-way ANOVA: Attitudes towards ICT by Academic Rank

ANOVA						
		Sum of Squares	df	Mean Square	F	Sig.
Attitude1	Between Groups	.351	2	.175	.358	.700
	Within Groups	146.735	299	.491		
	Total	147.086	301			

Attitude2	Between Groups	2.917	2	1.459	.788	.456
	Within Groups	553.417	299	1.851		
	Total	556.334	301			
Attitude3	Between Groups	1.311	2	.656	.765	.466
	Within Groups	256.172	299	.857		
	Total	257.483	301			
Attitude4	Between Groups	1.215	2	.608	.726	.485
	Within Groups	250.162	299	.837		
	Total	251.377	301			
Attitude5	Between Groups	.100	2	.050	.056	.945
	Within Groups	266.443	299	.891		
	Total	266.543	301			
Attitude6	Between Groups	5.578	2	2.789	1.508	.223
	Within Groups	553.074	299	1.850		
	Total	558.652	301			
Attitude7	Between Groups	1.651	2	.825	.895	.410
	Within Groups	275.624	299	.922		
	Total	277.275	301			
Attitude8	Between Groups	1.202	2	.601	1.275	.281
	Within Groups	140.983	299	.472		
	Total	142.185	301			
Attitude9	Between Groups	.404	2	.202	.382	.683
	Within Groups	158.139	299	.529		
	Total	158.543	301			
Attitude10	Between Groups	.554	2	.277	.181	.834
	Within Groups	456.801	299	1.528		
	Total	457.354	301			
Attitude11	Between Groups	.684	2	.342	.367	.693
	Within Groups	278.578	299	.932		
	Total	279.262	301			
Attitude12	Between Groups	.839	2	.419	.404	.668
	Within Groups	310.277	299	1.038		
	Total	311.116	301			
Attitude13	Between Groups	1.634	2	.817	1.018	.363
	Within Groups	239.863	299	.802		
	Total	241.497	301			
Attitude14	Between Groups	7.603	2	3.801	2.744	.066
	Within Groups	414.159	299	1.385		
	Total	421.762	301			
Attitude15	Between Groups	1.500	2	.750	.441	.644
	Within Groups	507.904	299	1.699		

		AN	OVA			
		Sum of Squares	df	Mean Square	F	Sig.
Attitude1	Between Groups	7.243	6	.724	1.507	.136
	Within Groups	139.843	291	.481		
	Total	147.086	301			
Attitude2	Between Groups	13.382	6	1.338	.717	.708
	Within Groups	542.952	291	1.866		
	Total	556.334	301			
Attitude3	Between Groups	10.827	6	1.083	1.277	.243
	Within Groups	246.656	291	.848		
	Total	257.483	301			
Attitude4	Between Groups	14.019	6	1.402	1.719	.076
	Within Groups	237.358	291	.816		
	Total	251.377	301			
Attitude5	Between Groups	15.335	6	1.534	1.776	.064
	Within Groups	251.208	291	.863		
	Total	266.543	301			
Attitude6	Between Groups	45.506	6	4.551	2.581	.055
	Within Groups	513.146	291	1.763		
	Total	558.652	301			
Attitude7	Between Groups	8.744	6	.874	.948	.490
	Within Groups	268.531	291	.923		
	Total	277.275	301			
Attitude8	Between Groups	8.050	6	.805	1.746	.070
	Within Groups	134.135	291	.461		
	Total	142.185	301			
Attitude9	Between Groups	5.118	6	.512	.971	.469
	Within Groups	153.425	291	.527		
	Total	158.543	301			
Attitude10	Between Groups	12.056	6	1.206	.788	.641
	Within Groups	445.298	291	1.530		
	Total	457.354	301			
Attitude11	Between Groups	12.837	6	1.284	1.402	.179
	Within Groups	266.425	291	.916		
	Total	279.262	301			
Attitude12	Between Groups	10.549	6	1.055	1.021	.425
	Within Groups	300.567	291	1.033		
	Total	311.116	301			
Attitude13	Between Groups	7.062	6	.706	.877	.556

Table J. Olie-way ANOVA. Alliques lowalus ICT by Ocographic Alea	Table 5. One-way	ANOVA:	Attitudes	towards ICT	by	Geographic Area
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	Within Groups	234.435	291	.806		
	Total	241.497	301			
Attitude14	Between Groups	11.309	6	1.131	.802	.627
	Within Groups	410.452	291	1.410		
	Total	421.762	301			
Attitude15	Between Groups	17.288	6	1.729	1.022	.424
	Within Groups	492.116	291	1.691		
	Total	509.404	301			

APPENDIX C

The List of the Selected Universities

The following table is the list of the selected universities which were used in this survey and their corresponding websites. Three universities have been selected randomly from each geographic area of Turkey. Twenty one universities were selected in total.

Marmara	Website
1. Boğaziçi University	http://www.boun.edu.tr
2. Namık Kemal University	http:// www.nku.edu.tr
3. Istanbul Technical University	http:// www.itu.edu.tr
Aegean	
1. Ege University	http:// www.ege.edu.tr
2. Celal Bayar University	http:// www.bayar.edu.tr
3. İzmir Institute of Technology	http:// www.iyte.edu.tr
Central Anatolia	
1. Middle East Technical University	http:// www.metu.edu.tr
2. Bilkent University	http:// www.bilkent.edu.tr
3. Gazi University	http:// www.gazi.edu.tr
Mediterranean	
1. Çukurova University	http:// www.cu.edu.tr
2. Mersin University	http:// www.mersin.edu.tr
3. Sütçü İmam University	http:// www.ksu.edu.tr
Black Sea	
1. Ondokuz Mayıs University	http:// www.omu.edu.tr
2. Karadeniz Technical University	http:// www.ktu.edu.tr
3. Bülent Ecevit University	http:// www.beun.edu.tr
Eastern Anatolia	
1. Atatürk University	http:// www.atauni.edu.tr
2. İnönü University	http:// www.inonu.edu.tr
3. Ağrı University	http:// www.agri.edu.tr
Southeastern Anatolia	
1. Dicle University	http:// www.dicle.edu.tr
2. Gaziantep University	http:// www.gantep.edu.tr
3. Harran University	http:// www.harran.edu.tr

The List of the Universities and Their Websites

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