Eskişehir Osmangazi Üniversitesi Sosyal Bilimler Dergisi, 11(1)

AN EMPIRICAL STUDY ON ATTITUDES OF FUTURE MANAGERS AND EMPLOYEES TOWARD ETHICAL USE OF COMPUTERS

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Abstract

Computers are changing almost everything in our personal and social life: from communication to education, from business to entertainment. These changes create some ethical issues which we were not anticipated. In particular, the easy of accessing, downloading, changing and transmitting information provided by computers and the Internet have made unethical behaviors easier for students. The purpose of this study is to investigate factors affecting attitudes of future managers and employees toward ethical use of computers. Data were obtained from a survey sample of 245 students in the Department of Business Administration at a public university in Turkey. The study findings have shown that gender, age and weekly computer usage time significantly affected students' attitudes toward ethical use of computers. The results suggest that female students are more sensitive than male students concerning to unethical use of computers. It is found that sensitivity to ethical issues in computer use rises as age increase. The results also revealed that students who use computers more are more likely to show unethical computer usage behavior.

Keywords: Computer Ethics, Ethics, Computer Use, Ethical Attitudes

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GELECEĞİN YÖNETİCİ VE ÇALIŞANLARININ BİLGİSAYARLARIN ETİK KULLANILMASINA YÖNELİK TUTUMLARINA İLİŞKİN AMPİRİK BİR ÇALIŞMA

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Özet

Bilgisayarlar, iletişimden eğitime, işten eğlenceye kadar kişisel ve sosyal hayatımızda hemen her şeyi değiştirmiştir. Bu değişiklikler, beklenmeyen bazı etik sorunlar ortaya çıkarmıştır. Özellikle, bilgisayar ve İnternet sayesinde bilgiye erişimin, indirmenin, değiştirmenin ve iletimin kolaylaşması, öğrenciler için etik olmayan davranışları daha da kolaylaştırmıştır. Bu çalışmanın amacı, geleceğin yönetici ve çalışanlarının bilgisayarların etik kullanılmasına yönelik tutumlarını etkileyen faktörleri araştırmaktır. Veri, Türkiye'de bir devlet üniversitesinde öğrenim gören 245 İşletme Bölümü öğrencisine uygulanan bir anketten elde edilmiştir. Çalışmanın sonuçları, cinsiyet, yaş ve haftalık bilgisayar kullanım süresinin öğrencilerin bilgisayarların etik kullanılmasına yönelik tutumlarını etkilediğini göstermektedir. Sonuçlar, bilgisayarların etik olmayan bir şekilde kullanımına karşı kız öğrencilerin erkek öğrencilerden daha duyarlı olduğunu göstermektedir. Yaş ilerledikçe bilgisayar kullanımı ile ilgili etik duyarlılığın arttığı saptanmıştır. Ayrıca, araştırma sonuçları, bilgisayarı daha fazla kullanan öğrencilerin bilgisayar kullanımında etik olmayan davranışlar göstermesinin daha olası olduğunu ortaya çıkarmıştır.

Anahtar Kelimeler: Bilgisayar Etiği, Etik, Bilgisayar Kullanımı, Etik Tutumlar.

1. INTRODUCTION

Computer is accepted as one of the most important technological advances in the twentieth century (Sackson, 1996). Computers and the Internet have changed the way we live, the way we communicate, the way we get education, and the way we make business (Mason, 1986; Banerjee et al., 1998; Sedlet, 1999, Lee and Chan, 2008). Today, many businesses and educational institutions depend on computers and Internet for their day to day operations (Masrom et al., 2008; Abdul Karim et al., 2009).

There is no doubt that these technologies have had considerable impact on our lives. The tradeoff between the benefits and dangers for a person or a society, however, is controversial (Mason, 1986; Banerjee et al., 1998; Sedlet, 1999, Lee and Chan, 2008). The easy of accessing, downloading, changing and transmitting information provided by computers and the Internet have enlightened many people but, in turn, have increased the use of computers for unethical and illegal activities such as spamming, hacking and making illegal copies of software (Masrom et al., 2008). According to Sackson (1996) as people become increasingly 'computer literate', the gap between technology and people' intellect noticeably shrinks.

Technological developments such as computers and the Internet create new opportunities for action and new sets of choices that are ultimately of a moral nature (Mullen and Horner, 2004). In other words, constant technological changes require new attitudes towards new situations arose from the technological developments like computers and the Internet etc. (Masrom et al., 2008). However, technological changes penetrate societies faster than people can form new attitudes, reach new consensus, or adapt legal and ethical codes (Bercu, 1991). Therefore, adoption of computer ethics is slower than adoption of computer related technologies (Lee and Chan, 2008).

As a result, both use and misuse of computers and the Internet have increased significantly. While proper use of these technologies has proven to be beneficial to businesses, professionals and educational institutions, inappropriate use has caused significant losses to businesses and society (Banerjee et al., 1998).

There have been few studies of computer ethics in Turkey and computer ethics awareness among undergraduate students has not been investigated thoroughly yet. This study was conducted among undergraduate students

of the Department of Business Administration at a Turkish public university to gain insight about their attitudes toward ethical use of computers.

2. COMPUTER ETHICS

As a philosophical subject, ethics is a field of study about decision making and actions of free individuals. Ethics helps people to make the correct decision when faced with alternative courses of action or alternative goals to pursue (Laudon, 1995). The American Heritage Dictionary defines the term "ethics" as "The rules or standards as governing the conduct of a person or the members of a profession."

Computer ethics is a branch of applied philosophy which deals with how computer users should make decisions regarding professional and social conduct. Some of the definitions of computer ethics are presented below.

Moor (1985) gave a broad and influential definition of computer ethics as "computer ethics is the analysis of the nature and social impact of computer technology and the corresponding formulation and justification of policies for the ethical use of such technology."

Barnard et al., (2003) defined computer ethics as the study of those behavioral actions of Information and Communication Technologies (ICT) professionals that will benefit all of society.

According to Gotterbarn (1991), computer ethics is "ethical values, rules and judgements applied in a computing context based on professional standards and a concern for the user of the computing artifact."

Ki and Ahn (2006) defined computer ethics as "a standard for computer use, signifying the prevention of copyright infringement, such as the reproduction of software, invasion of privacy, and circulation of objectionable material."

Masrom et al., (2008) adopted a short and concise definition of computer ethics as ethics related to computer use or technology.

Consequently, computer ethics stems from practical concerns arising in connection with the impact of ICTs on contemporary society (Floridi and Sanders, 2002). Computer ethics is an applied ethics that considers ways of forming arguments and judgments on particular ICT related activities, e.g. hacking, privacy and software theft (Adam, 2001).

Bynum (2001) has carefully documented and explored the history of computer ethics. Even though he didn't use the term "computer ethics", computer ethics was created as a field of scholarly research by Norbert Wiener in 1940s (Bynum, 2001). In the 1970s Walter Maner first used the term "Computer Ethics" to refer to "ethical problems aggravated, transformed or created by computer technology" (Kallman, 1991; Bynum, 2001). After since, interest in this area as an important field of research has been growing (Kallman, 1991).

There is a discussion about the nature of computer ethics called the "uniqueness debate". One of the topic in this debate whether computer technology has created genuinely new and unique ethical issues (Maner, 1996; Gotterbarn and Rogerson, 1997; Floridi and Sanders, 2002; Coleman, 2007). Some philosophers, including Deborah G. Johnson don't believe that computers created new moral problems. According to Johnson (1985) "Computers pose new versions of standard moral problems and moral dilemmas, exacerbating the old problems, and forcing us to apply ordinary moral norms in uncharted realms" (Bynum and Rogerson, 2003: 17).

Today's advanced ICTs have increased the use of computers for illegal purposes or unethical activities such as unauthorized access and use of computer systems (Masrom et al., 2008; Akbulut et al., 2008, a). Khan (2007) listed common unethical behaviors in the area under four categories: access/network, security, software and personal. The unethical behaviors fall under each category can be shown as follows;

- The access/network category: cracking or stealing passwords, gaining unauthorized access; stealing Internet connections, monitoring content flowing over the Net, committing Internet fraud, overloading e-mail accounts (spam), sending worms and viruses, forging digital signatures and/or documents, tampering with wireless Networks, overloading with traffic, presenting incomplete and/or inaccurate information on the Web site, and disrupting network infrastructure.
- The security category: stealing data, disclosing data to unauthorized people, modifying data without authorization, improperly destroying data, and not following organizational policy on data security.
- The software category: tampering with software, releasing software without adequate testing, making intentional programming errors, installing and/or using unauthorized software, stealing codes, and illegally copying software.

- The personal category: surfing illegal and/or illicit Web sites, using office computers for personal business, using unlicensed software for personal use, and destroying computer resources.

There are many unethical behaviors related to the computer usage. While some unethical behaviors may cause serious financial and legal problems for an organization, others are minor and may not result in significant financial or legal burdens. For example, unauthorized access to a confidential or critical database can cause an important problem, while installing unlicensed software, though unethical, is not equally devastating (Khan, 2007). Some unethical acts have short term effects, some others have long term effects or some of the consequences can be seen immediately, some may be seen in the course of time.

There are some factors that determine the severity of unethical acts or behaviors. According to Khan (2007) these factors are amount of potential loss or gain derived from unethical acts; number of individuals or size of organizations affected by unethical acts, society's perceptions of the seriousness of unethical behaviors, existence of criminal or civil laws against certain unethical acts, presence of organizational policy or policies on unethical behaviors, and explicit intention to cause harm or loss.

Illegal and unethical use of information technologies is estimated to cost billions of dollars of losses for businesses and corporations (Peslak, 2007) and none are immune from the consequences that can result (Hinduja, 2003). Problems associated with ICT misuse in the organizations include lost of productivity and the opening of the company to risk through lawsuits or computer viruses (Perreault and Keith, 2004).

3. COMPUTER ETHICS IN HIGHER EDUCATION

Today, computers and the Internet have been heavily utilized in the higher academic institutions as a part of the processes and tools of learning within internal and external classroom environments (Abdul Karim, et al., 2009). However, studies suggest that undergraduate students have some misunderstandings about ethical use of computers and the Internet.

According to Calluzzo and Cante (2004), students had misconceptions about what represented ethical and unethical behaviors in the use of software and ICTs. For example, Cohen and Cornwell (1989) found that many students are unaware that software piracy illegal or unethical. It is

possible that if university students are uncertain about what constitutes appropriate and inappropriate behavior then this uncertainty will be carried forward into their workplaces after graduation (Calluzzo and Cante, 2004; King and Case, 2007). Many companies depend on people who are computer literate and computer users face ethical problems everyday in the work-place. For these reasons university students who are future employees and managers should be aware of ethical computer usage before graduation (Pierce and Henry, 1996; Calluzzo and Cante, 2004).

Recent studies suggest that Internet facilitates and spreads academic dishonesty (Akbulut et al., 2008, a; King and Case, 2007). The pervasive use of computers and the Internet and the convenient mechanism it provides, such as easy access, easy downloads, and easy copy and paste functions have made many types of unethical behaviors easier, particularly those involving students in academic settings (Abdul Karim, et al., 2009). Plagiarism, downloading software or using computers in an unauthorized manner are some of the unethical behaviors of the university students (Zopiatis and Krambia-Kapardis, 2008). Although cheating and the plagiarism problem are not new, they have increased in recent years (McCabe et al., 2001). The Internet is accepted as one of the reasons of a perceived increase in plagiarism (Howard, 2007).

Cohen and Cornwell (1989) determined that 58% of the college students had personally pirated and majority of students feel that software piracy and other forms of unethical practices in information system usage are acceptable. Siegfried (2004) found that students generally felt that copying commercial software and downloading music from the Internet was acceptable. Law and Wong report that (2005) most students have used or purchased pirated software.

Studies show that there are several factors affecting students' attitudes toward ethical computer usage. These factors are examined briefly below.

4. FACTORS AFFECTING STUDENTS' ATTITUDES TOWARD ETHICAL USE OF COMPUTERS

The factors that affect students' attitudes toward ethical use of computers can be classified as technology related factors, situational factors and demographics factors. One of the examples of the technology related factors is the Internet. The Internet enhances users' temptation, opportunity, and anonymity and reduces the perceived illegality of wrong doings (Freestone and Mitchell, 2004). Teachers' and classmates'

behaviors can be given as examples of situational factors that encourage or discourage students' unethical behaviors. In addition to technology related factors and situational factors, demographic factors such as gender, age, Internet experience, computer usage time, academic level, and personality may also affect students' attitudes toward ethical use of computers. The present study focuses on following demographic factors.

4.1. Gender

Gender is one of the most researched demographic variables in the literature of ethics in evaluating ethical attitudes of subjects (Roxas and Stoneback, 2004). Simon and Chaney (2006) compared the business students' ethical perceptions about computer activities between 1994 and 2004 and found that gender appeared to be the strongest factor in both studies. Simon and Chaney (2006) found that female students perceive certain computer activities as more unethical than male students do. Beycioglu (2009) found that prospective female teachers were more concerned about ethical issues than prospective male teachers did.

Harris (2000) found that there was a difference in attitudes toward ethical use of information systems between male and female students in 8 of the 20 situations; female students showed a higher sensitivity to software issues than male students did.

McCarthy et al., (2005) determined significant differences between male and female computer information systems students in their ethical beliefs related to ICT usage.

Halawi and Karkoulian (2006) surveyed 150 college students (95 undergraduates and 55 graduate students) with a questionnaire using six ethical scenarios and fourteen behaviors and found that there is a difference in perception to ethical situations between females and males in certain ethical situations.

Peslak (2007) found that gender did not significantly affect recognition of information technology intellectual property ethical issues with the one exception of copying others' software. Peslak found that copying others' software was significantly related to gender. Calluzzo and Cante (2004) didn't find significant differences in ethical judgments regarding information technology and software use based on gender. Masrom et al. (2008) found minimal differences between male and female students in regards to their ethical awareness of computer use.

4.2. Age

There are many studies have investigated the impact of age on ethical decision making regarding the use of information technologies. Peslak (2007) found that age significantly affects attitudes toward certain information technology intellectual property issues; generally older individuals more readily follow ethical norms. Simon and Chaney (2006) found that older students perceive certain computer practices as more unethical than younger students do. Gan and Koh (2006) found that age was negatively related to software piracy. Masrom et al. (2008) found that there was a significant difference in ethical awareness of computer use between 20-25 year-old students and 26-40 year-old students in only one out of ten items.

4.3. Computer and Internet Experience

Gan and Koh (2006) found that computer experience or computer usage demonstrated an ambiguous relationship to software piracy. Beycioglu (2009) concluded that prospective teachers who had up to five years of PC experience considered ethical computer use more than those with five years and beyond did. Masrom et al. (2008) found that there was a significant difference in ethical awareness of computer use between students regarding their duration of computer use in one out of ten items. Akbulut et al. (2008, b) found no significant differences between high and low experienced PC users' attitudes regarding unethical computer using behaviors. Nara and Keenan (2001) found that students whose frequency of use of the Internet is high have low-level computer ethics. Underwood and Szabo (2003) investigated the attitudes to, and extent of, self-reported involvement in Internet supported dishonest academic practices and they found that Internet experience, acceptability of cheating and assessment of risk predicted an individual student's acceptance of acts such as plagiarism as a legitimate way to achieve academic goals.

4.4. Academic Level

Halawi and Karkoulian (2006) found that there is a difference in perception to ethical situations between undergraduate and graduate business information systems' students. Calluzzo and Cante (2004) found that graduate and undergraduate students were quite ethical in those behaviors associated with personal privacy, personal property or outright theft. McCarthy et al. (2005) have found no significant ethical differences among undergraduate and graduate students' attitudes. Harris (2000) analyzed students' ethical decision making related to information system scenarios and researched that whether the sensitivity of ethics change as students mature and progress through various academic levels. Harris

found that there is a difference in attitudes between at least two of the three groups (freshman/sophomores, junior/senior, and graduate) in 10 of the 20 situations. Graduate students indicated the highest sensitivity in all but one of these situations and rated the action of the individual higher on the scale.

4.5. Other Factors

Students' universities, personalities, ethical beliefs and social cultures may also affect their attitudes toward ethical computer use. Masrom et al. (2008) found that the ethical awareness of computer use of the students differ most significantly on the basis of the university which students enrolled.

Abdul Karim et al. (2009) found that personality traits such as agreeableness, conscientiousness and emotional stability are significantly and negatively correlated with the unethical behaviors of the students.

Nara and Keenan (2001) found that students who have high-level general ethics also have high-level computer ethics and students who have high-level empathy also have high-level computer ethics.

Whitman et al. (1999) show that there are some inter-cultural similarities as much as inter-cultural differences about students' ethical attitudes toward computer use. Hay et al. (2001) indicate that the ethical perceptions of the students in computer-related situations differ most significantly on the basis of their cultural backgrounds.

5. RESEARCH METHODOLOGY

There have been few studies of computer ethics in Turkey and computer ethics awareness among undergraduate students in the Departments of Business Administration has not been investigated sufficiently yet. Therefore, we decided to examine the subject thoroughly.

5.1. Participants

This study was conducted in the spring semester of 2009. A convenience sampling technique was used to obtain the data needed for the statistical analysis. A total of 307 full time students of the Department of Business Administration at a public university in Turkey were asked to respond to the questionnaire. After incomplete and unusable responses were excluded, 245 valid questionnaires were used in the analyses. Sample characteristics of the study are provided in Table 1.

Table 1: Characteristics of the Participants

	Frequency	%
Gender		
Male	89	36.3
Female	156	63.7
Age		
17-20	129	52.7
21-26	116	67.3
Academic Level		
Freshman	108	44.1
Sophomore	48	19.6
Junior	52	21.2
Senior	37	15.1
Weekly Computer Usage Time		
1-6 hours	110	44.9
> 6 hours	135	55.1
Internet Experience		
1-4 years	108	44.1
> 4 years	137	55.9
E-Mail Users		
Yes	230	93.9
No	15	6.1
Internet shopping		
Yes	52	21.2
No	193	78.8

5.2. Hypotheses

The main purposes of this study were to investigate whether gender, age, Internet experience and weekly computer usage time influence attitudes of undergraduate business students toward ethical use of computers and the following hypotheses were proposed:

H1: There is a significant relationship between the students' gender and their attitudes toward ethical use of computers.

H2: There is a significant relationship between students' age and their attitudes toward ethical use of computers.

H3: There is a significant relationship between students' Internet experience and their attitudes toward ethical use of computers.

H4: There is a significant relationship between students' weekly computer usage time and their attitudes toward ethical use of computers.

5.3. Instrument

A questionnaire was used as a data collection instrument in this study. The questionnaire used in this study was comprised of two parts. The first part was developed to collect demographic information. The second part

was comprised of 28 items measuring attitudes toward ethical computer use. 10 items in this part of the questionnaire were adapted from "Ten Commandments of Computer Ethics (Barquin, 1992)," (as used in Masrom et al., 2008). Remaining 18 items were adapted from "unethical computer using behavior scale (UECUBS)" developed by Namlu and Odabaşı (2007). Respondents were asked to evaluate 28 computer ethics related item in the questionnaire on a five-point Likert scale ranging from 1 (Strongly Disagree), 2 (Disagree), 3 (Neutral), 4 (Agree) to 5 (Strongly Agree). Lower score means that subjects consider related behaviors as unethical. In other words, they do not approve those behaviors.

The twenty-eight attitude items in the questionnaire were tested for reliability. Cronbach's Alpha was calculated as 0.925, which can be considered sufficient. The corrected item-total correlation for all items was adequate **(**the corrected item-total correlation ranged from 0.45 to 0.69 with a mean of 0.56**)**. Thus, the reliability of the instrument was generally supported.

5.4. Analysis

After eliminating incomplete and unusable questionnaires, 245 responses were used for analysis. The data were analyzed by using descriptive statistics, multiple regression analysis and Student's t-test.

The relationship between students' gender, age, Internet experience, weekly computer usage time and their attitudes toward ethical use of computers was investigated using the multiple regression analysis and the data were further examined using t-test.

6. RESULTS AND DISCUSSION

A mean for each item was computed. The highest mean score was 2.18 and dealt with "Copy or use proprietary software for which you have not paid." Other high mean scores were "Copying licensed CDs, DVDs." (2.15), "Using materials like pictures, animations, etc. without the consent of the owner." (1.97) and "Using crack programs" (1.88). The lowest mean score was 1.09 corresponding to "Use a computer to steal." Other low mean scores were "Deliberately sending a virus by e-mail." (1.13), "Sending one's personal information to a web page without permission." (1.15) and "Deliberately damaging the hardware of computers designed for public use." (1.15).

Multicollinearity was examined by variance inflation factor (VIF) test for the multiple regression analysis. Since each independent variable's VIF

was calculated as less than 2, multicollinearity was not observed as a problem.

Table 2: The Results of the Multiple Regression Analysis

	B	**Beta**	**t**	***p* value**
Gender	-7.466	-0.284	-4.865	**<0.001***
Age	-1.783	-0.228	-3.787	**<0.001***
Internet experience	0.649	0.044	0.702	0.483
Weekly computer usage time	1.422	0.277	4.341	**<0.001***
R^2=0.201, F=15.134, *p*=<0.001				

The results of the multiple regression analysis and t-tests are presented in Table 2 and Table 3, respectively. Study findings are summarized in the following paragraphs.

The results of the multiple regression analysis reveal that three of four independent variables; gender, age and weekly computer usage time, significantly affected students' attitudes toward ethical use of computers. The model explains 20.1 percent of variation in the dependent variable by the independent variables.

6.1. Students' gender and their attitudes toward ethical use of computers

The first hypothesis was to test for statistically significant relationship between students' gender and their attitudes toward ethical use of computers. According to the results of the multiple regression analysis, there is a significant relationship between students' gender and their attitudes toward ethical use of computers (see Table 2).

The mean score of male students was higher than the mean score of female students for all the items. The results of two sample t-test comparing the attitudes of males and females regarding various issues of computer ethics revealed that there was a significant difference in 20 of the 28 items between male and female students' responses (18 of these differences at the 5% level and 2 of them at the 10% level) (see Table 3). The highest difference between male and female mean scores was 0.83 corresponding to "Copy or use proprietary software for which you have not paid." The lowest difference between male and female mean scores was 0.07 corresponding to "Sending one's personal information to a web page without permission."

These results suggest that female students have higher ethical attitudes related to the computer usage than male students have. In other words, male students are less sensitive than female students regarding to unethical use of computers. These results were consistent with the previous studies' findings suggesting that female students have more positive attitudes toward ethical use of information technologies than male students (Beycioglu, 2009; McCarthy et al., 2005; Simon and Chaney, 2006). Thus, hypothesis H1 was supported by the results of t-test and the multiple regression analysis.

6.2. Students' age and their attitudes toward ethical use of computers

The second hypothesis was to test for statistically significant relationship between students' age and their attitudes toward ethical computer use. The multiple regression analysis results showed significant relationship between students' age and their attitudes toward ethical use of computers (see Table 2).

Table 3: The Results of t-Tests

	Gender p	Age p	Internet experience p	Weekly PC usage time p
Use a computer to harm other people.	**0.004***	0.374	0.992	0.402
Interfere with other people's computer work.	0.178	0.147	0.754	0.332
Snoop around in other people's computer files.	**0.073****	0.159	0.821	0.603
Use a computer to steal.	**0.009***	**0.070****	0.230	0.213
Use a computer to bear false witness.	0.180	0.591	0.292	0.595
Copy or use proprietary software for which you have not paid.	**<0.001***	0.701	**0.017***	**<0.001***
Use other people's computer resources without authorization or proper compensation.	**0.020***	0.316	0.320	**0.090****
Appropriate other people's intellectual output.	0.146	0.374	0.638	0.640
Using crack programs.	**<0.001***	**0.011***	0.222	**0.046***
Copying licensed CDs, DVDs.	**0.003***	**0.096****	**0.023***	**0.004***
Selling licensed CDs, DVDs which are reproduced against regulations.	**<0.001***	0.712	**0.014***	**0.030***
Using materials like pictures, animations, etc. without the consent of the owner.	**0.005***	0.220	0.136	**0.011***
Do not think about the social consequences of the program you are writing or the system you are designing.	**0.004***	0.427	0.590	**0.011***

Do not use a computer in ways that ensure consideration and respect for your fellow humans.	**0.007***	0.716	0.695	**0.075****
Disturbing people by using the advantage of virtual environment.	**<0.001***	0.409	0.361	**0.008***
Carrying propaganda in Internet that threatens social peace.	0.119	0.150	0.648	**0.097****
Allowing children to play computer games of violence.	**<0.001***	0.142	**0.018***	**0.008***
Permitting children to enter inappropriate sites on Internet in Internet Cafes.	**0.016***	0.265	0.104	**0.014***
Web masters' delivering the personal information of members to other people.	**0.074****	**0.007***	0.761	0.112
Deliberately damaging the hardware of computers designed for public use.	0.105	0.167	0.767	0.956
Copying the data in a computer without the consent of the owner.	**0.050***	0.237	0.864	**0.082****
Sending a private mail to others without the consent of the sender.	0.179	0.869	**0.035***	**0.052****
Sending pornographic mail to people without request.	**0.040***	0.564	0.361	**0.006***
Deliberately sending a virus by e-mail.	**0.017***	0.470	0.669	**0.098****
Using others' personal information without permission.	0.217	0.415	0.257	**0.048***
Sending one's personal information to a web page without permission.	0.217	**0.062****	0.968	0.188
Using the network of an individual or institution to access Internet without permission.	**0.002***	**0.050***	**0.047***	**0.020***
Hacking through Internet.	**<0.001***	**0.017***	0.305	**0.059****

* indicates significant at the 0.05 level, ** indicate significant at the 0.10 level

A comparison of the means with two sample t-test revealed that older students show more positive attitudes toward ethical computer use than younger students in 7 of the 28 items. The results of t-tests show that 7 of the 28 items resulted in significant differences between 17-20 years old students' and 21-26 years old students' responses (see Table 3). The highest difference between younger and older students' mean scores was 0.38 corresponding to "Using crack programs." The lowest difference between younger and older students' mean scores was 0.03 corresponding to "Sending a private mail to others without the consent of the sender."

The mean score of 17-20 years old students was higher than the mean score of 21-26 years old students for all items but one that was "Sending pornographic mail to people without request." These results suggest that younger students consider unethical computer using behavior more appropriate than older students. Our study's findings are in agreement with the results reported by Gan and Koh, 2006; Peslak, 2007; Simon and Chaney, 2006. Based on the results of t-test and the multiple regression analysis, hypothesis H2 was accepted.

6.3. Students' Internet experience and their attitudes toward ethical use of computers

The third hypothesis was to test for statistically significant relationship between student' Internet experience and their attitudes toward ethical computer use. The results of the multiple regression analysis suggest that there is no significant relationship between students' Internet experience and their attitudes toward ethical use of computers (see Table 2). Therefore, hypothesis H3 wasn't supported.

Means comparison using independent samples t-test revealed that there was a significant difference between students with Internet experience less than 4 years and students with Internet experience more than 4 years in 6 of 28 items (see Table 3). The highest difference between mean scores of students with less Internet experience and students with more Internet experience was 0.39 corresponding to "Copy or use proprietary software for which you have not paid." The lowest difference between mean scores was 0.0007 corresponding to "Use a computer to harm other people." and "Sending one's personal information to a web page without permission."

The mean score of students with more Internet experience was higher than the mean score of students with less Internet experience for all items but five. The lowest mean score of students with less Internet experience was 1.06 corresponding to "Use a computer to steal." The item having the lowest mean score was the same for students with more Internet experience. The highest mean score of students with less Internet experience was 2.29 corresponding to "Copying licensed CDs, DVDs" and also the item having the highest mean score was the same for students with more Internet experience.

6.4. Students' weekly computer usage time and their attitudes toward ethical use of computers

The fourth hypothesis was to test for statistically significant relationship between students' weekly computer usage time and their attitudes toward ethical computer use. The results of the multiple regression analysis indicated that there is a significant relationship between students' weekly computer usage time and their attitudes toward ethical computer use (see Table 2).

The results of t-test show that there was a significant difference between attitudes of students with less computer usage and attitudes of students with more computer usage in 19 of 28 items (see Table 3). The highest difference between mean scores of students with less computer usage and students with more computer usage was 0.67 corresponding to "Copy or use proprietary software for which you have not paid." The lowest difference between mean scores was 0.0027 corresponding to "Deliberately damaging the hardware of computers designed for public use."

The mean score of students with more computer usage was higher than the mean score of students with less computer usage for all items. The results of t-test and the multiple regression analysis suggest that students with more computer usage are more likely to show unethical computer usage behavior comparing to students with less computer usage. Therefore, H4 was supported.

7. CONCLUSIONS

The main purpose of the current study was to explore the factors affecting the attitudes of future managers and employees toward ethical computer usage. It was investigated that whether gender, age, Internet experience and weekly computer usage time influence attitudes of undergraduate business students toward ethical use of computers. Data was gathered from students of the Department of Business Administration at a public university in Turkey.

The results of the study indicate that attitudes of students toward ethical use of computers are significantly affected by gender, age and weekly computer usage time.

This study has shown that there is a significant difference between male and female students regarding attitudes toward ethical computer use in certain situations. Female students are more sensitive than male students

concerning to unethical use of computers. The mean score of male students was higher than the mean score of female students for all items. This result is consistent with previous studies suggesting that the female students show more positive attitudes toward ethical use of information technologies than male students.

The study results showed that significant differences existed between younger and older students' attitudes in various computer ethics related issues. Generally, older students consider ethical computer using behavior more appropriate than younger students do. The results indicate that sensitivity to ethical issues in computer use rises as age increases.

Another important finding of the study was that students who use computers more are more likely to show unethical computer usage behavior than their counterparts do. The mean score of students with more computer usage was higher than the mean score of students with less computer usage for all items. Findings of the study suggest that weekly computer usage time is also a significant factor affecting students' attitudes toward ethical use of computers.

In terms of Internet experience, it was found that there was a significant difference between students with Internet experience less than 4 years and students with Internet experience more than 4 years in only 6 of 28 items. However, it was found that there was no significant relationship between students' Internet experience and their attitudes toward ethical use of computers.

These results show that teaching computer ethics is a critical and important task for the business schools. The schools' function regarding computer ethics education is more important than other organizations' function. The affects of the regulation of law and the protection policy of the government are limited, and cannot fully provide ethical attitude and sense of responsibility to user of computers and the Internet. (Ki and Ahn, 2006) Students will make better and knowledgeable decisions regarding information technology usage if they are made aware of the related risks and ethical issues (Perreault and Keith, 2004).

Proactive steps should be taken in order to minimize unethical behaviors among university students. Education is one of the most common recommendations in the literature for preventing the unethical use of computers and raising awareness. Thomas and Ahyick (2010) consider it to be important for students to learn ethics, in order to improve their ethical decision making. The study of ethics helps students to recognize

problems in society (Perlman and Varma, 2001), to understand different points of view and allows them to consider other people and their needs (Thomas and Ahyick, 2010). The study of ethical dilemmas about computer usage helps students to consider their options in a safe environment and opens their minds to different possibilities and choices that they may need to make later in life after graduation (Thomas and Ahyick, 2010). Education on ethical topics and information technology use should include ethical use of information technologies and software in the curriculum and should be supported by the real life case studies. For example giving examples of arrested software pirates and hackers in the lectures might create a deeper awareness of the seriousness of the consequences of unethical and illegal use of information technology.

A clearly stated information technology usage policy should be adopted by the universities. And, students should be informed about relevant legislation and university policy for use of information technology resources.

There are also technological measures that can be used by the universities for preventing the unethical use of computers such as software piracy in the campus. Internet traffics should be monitored in the university. Filtering out certain types of data, illegal Internet traffics and piracy websites may help to reduce software piracy among students (Hinduja, 2003).

Finally, a number of important limitations for this srudy need to be considered. The first limitation is that the convenience sampling technique was used for the selection of the study sample. Second limitation is that the study was administered in a public university in Turkey. For the future studies we strongly suggest that the inclusion of business students from different universities may provide opportunities to better understand impacts of demographic factors on business students' attitudes toward ethical use of computers. Besides all the limitations, this study provides valuable information to both academicians and practitioners regarding the issues of computer ethics.

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