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Determination of in internet privacy behaviours of students

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Abstract

The aim of this research is to determine internet privacy behaviors of students. The research was carried out in survey model. The study group of this research consists of students attending Ankara University Educational Sciences Institute Secondary Education Field Teaching Master of Arts without Thesis Programs (Physics, Chemistry, Biology, Mathematics, Social Studies and Philology) at the academic year of 2009-2010 and the total number of the students is 205 (females (n=163) and males (n=42)). Questionnaire was utilized as data collection instrument. The questionnaire consists of 42 questions covering the issues of privacy behaviors, general attention, technical protection and privacy concerns. 5-Point Likert type scale is utilized within the questions included in the questionnaire. T-Test, Kruskal-Wallis H test, Mann-Whitney U test and one-way ANOVA for independent samples were utilized in order to find out whether there are statistical significances according to the variables of internet privacy behaviors, genders, program enrolled, having computer, internet usage skills, internet usage frequencies and internet connection duration concerning students. At the end of the findings obtained within the scope of the research, it was found out that there are not any statistical significance between the privacy behaviors and genders, internet usage experiences and frequencies; on the other hand, it was found out that there are statistical significances between their attention behaviors and having computer, internet usage skills, technical protection, program enrolled and internet connection durations. As a result, it can be said that students display differences on technical protection in terms of having computer and usage skills, and also they display differences on attention behaviors in terms of program type and internet connection duration, but on the other hand, all students display similar behavior types on privacy concerns.
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1. Introduction

Developments in information and communication technologies gradually make our lives easier (Efe, R. 2009). For example, now we can do many bank transactions via personal computers in seconds, for which we used to wait in queues at branches. We can share personal information, photos and memories with others within seconds. Common internet access and mobile communication gradually produce a pile of explorable data that needs protection. However, misuse of such data entails privacy issues. With the evolution of information and communication technologies, privacy has paid greater attention. Many public surveys and privacy questionnaires have showed in different aspects that privacy issues are complex by nature (Ozkan, H., & Arikan, A. 2009). Social tendencies as well as technological factors are leading dynamics which affect privacy in temporary cases in societies (Waldo, Lin and Millett, 2007). When detailed research is reviewed, it is obvious that there are multidimensional

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definitions of types of privacy. informational privacy, accessibility privacy, social/communicational privacy, physical privacy, and expressive privacy (Buchanan, Paine, Joinson, and Reips, 2007; DeCew,1997; Dinev and Hart, 2004; Joinson and Paine, 2007).

In Turkey, the number of studies on privacy is low. Keeping the fact in mind, the aim of this research was to determine internet privacy behaviors of students in order to develop precautions for privacy concerns. To this end, the following research questions were answered:

1. Do privacy behaviors of students vary according to gender?
2. Do privacy behaviors of students vary according to types of programs they graduate from?
3. Do privacy behaviors of students vary according to computer ownership?
4. Do privacy behaviors of students vary according to frequency of internet use?
5. Do privacy behaviors of students vary according to self-assessment of internet usage skills?

2. Method

2.1. Participants

The descriptive study was carried out in survey model. The research group consisted of students attending Ankara University Educational Sciences Institute Secondary Education Field Teaching Master of Arts without Thesis Programs (Physics, Chemistry, Biology, Mathematics, Social Studies and Philology) at the academic year of 2009-2010, spring semester, and the total number of the students was 205 (females (n=163) (79.5%), and males (n=42) (20.5%). The mean of the participants' age was 25.32 and they were in the age range of 21-35 years old.

2.2. Data Collection Tool

A questionnaire was used as data collection tool. The questionnaire designed to determine privacy behaviors of students consisted of 42 questions. The questionnaire consisted of three sub-dimensions of privacy behaviors of students: general caution (6 questions), technical protection behaviors (12 questions) and privacy concerns (24 questions). Privacy behaviors were determined based on data by 5-Point Likert type scale. Data from the questions was analyzed in the view of equal intervals, ranging from (1) "never" to (5) "always". For personal information, there were questions which included demographic variables such as gender, type of program, computer ownership, internet usage skills, and frequency of internet use. Demographic data about the students' ages was collected from the enrollment forms at the institute.

2.3. Procedure

The questionnaires were personally applied by the researcher at the end of the final examinations at the 2009–2010 academic year, spring semester, with an instruction to explain the aim of the research. The participants answered questions in the research.

2.4. Data Analysis

SPSS 17 was used for statistical analyses. The answers to the questions were tested by one way analysis of variance (F test) in order to determine whether total score of the students varied according to the type of program after a block calculation. In cases where analysis of variance was significant, Scheffe technique was used to see between which groups the differences were. Non-correlational t-test was used to determine whether the participants varied according to gender. Moreover, One-Sample Kolmogrov Smirnova was used to test whether there was an even distribution in each sublevel of the independent variable whose effect on the dependent variable was tested. Kruskal-Wallis H test was used to determine whether there was a difference according to frequency of internet use and internet usage skills because of the variety of variance and the low number of observations in correlational analyses, while Mann-Whitney U test was used to determine whether there was a difference according to computer

ownership. In cases where Kruskal-Wallis H test was significant, Mann Whitney U test was used to comparatively test the paired groups to see between which groups the differences were (Büyüköztürk, 2010). In data analysis, $\alpha=0.05$ significance level was the basis. Furthermore, the results significant at $\alpha=0.01$ error level were included in the tables.

3. Findings

3.1. Findings of gender effect

t-test was used to determine whether privacy behaviors of students varied according to gender and the findings are presented in Table 1.

Table 1. t-test for score differences of general caution, technical protection and privacy concerns according to gender

Variables		N	M	SD	t	df	P
General Caution	Male	40	20.13	4.64	,59	195	0.55
	Female	157	19.71	3.80			
Technical Protection	Male	40	43.55	8.24	1,13	185	0.26
	Female	147	42.01	7.42			
Privacy Concerns	Male	42	85.14	22.10	1,66	197	0.09
	Female	157	90.10	15.65			

As a result of t-test applied in order to determine whether the difference between the means of the sub-dimension scores of the female and the male students was statistically significant, there was no significant difference between the score means of general caution, technical protection and privacy concerns. Score means of general caution and technical protection behaviors of the students were close to one another, while score means of the female students in privacy concerns (M=90.10) were higher than those of the male students (M=85.14). Yet, privacy behaviors of the female and the male students did not vary according to gender.

3.2. Findings of Program Effect

One way analysis of variance (ANOVA) was used to determine whether the students' scores of general caution, technical protection and privacy concerns varied according to program type.

Table 2. One way analysis of variance for score differences of general caution, technical protection and privacy concerns according to program type

Variables		N	M	SD	df*	F	P	Significant Difference (Scheffe)
General Caution	a) Physics- Chemistry- Biology	48	19.08	3.34	(3,193)	2.758	.044**	c>a c>d
	b) Social Studies	44	19.86	4.77				
	c) Philology	63	20.86	4.05				
	d) Mathematics	42	18.93	3.30				
Technical Protection	a) Physics- Chemistry- Biology	47	41.72	7.52	(3,183)	.298	.827	
	b) Social Studies	40	42.86	8.11				
	c) Philology	56	42.84	8.52				
	d) Mathematics	44	41.89	5.99				
Privacy Concerns	a) Physics- Chemistry- Biology	47	90,11	16.30	(3,195)	3.641	.014**	
	b) Social Studies	46	94.59	14.44				b>d
	c) Philology	63	88.46	17.74				
	d) Mathematics	43	82.86	18.76				

*The first figure in df shows degree of freedom between groups, and the second figure shows degree of freedom within groups.
** P<.05

The results are presented in Table 2. As it is clear from Table 2, the mean scores according to program type in general caution [$F_{(3-193)}$=2.758, $p<.05$] and privacy concerns [$F_{(3-195)}$=3.641, $p<.05$] were significant at the level of 0.05, but insignificant in terms of technical protection score means. Scheffe test was applied as a post hoch test to determine between which groups the differences of mean scores according to program types were. As a result of Scheffe test, it was observed that there were significant differences between the score mean of general caution of the students from philology program (M=20.86) and the score mean of general caution of the students from Physics-Chemistry- Biology program (M=19.08) according to program type in favor of those from philology program. Also, there were significant differences between the score mean of general caution of the students from philology program (M=20.86) and the score mean of general caution of the students from Mathematics program (M=18.93) in favor of those from philology program. Similarly, according to program type, there was a significant difference between the privacy concern mean score of the students from Social Studies program (M=94.59) and the privacy concern mean score of the students from Mathematics program (M=82.86) in favor of those from Social Studies program.

3.3. Findings of Computer Ownership Effect

94.1% (N=193) of the students included in the research were computer owners, whereas 5.9% (N=12) were non-owners. Mann Whitney U test was applied to determine whether privacy behaviors of the students varied according to computer ownership and the findings are presented in Table 3.

Table 3. Mann Whitney U test results for score differences of general caution, technical protection and privacy concerns according to computer ownership

Variables		N	Mean Rank	Sum of Rank	U	P
General Caution	Computer owners	186	99.30	18470.00	967.00	.760
	Non-owners	11	93.91	1033.00		
Technical Protection	Computer owners	179	95.34	17065.50	476.50	.109
	Non-owners	8	64.06	512.50		
Privacy Concerns	Computer owners	187	100.97	18881.50	940.50	.348
	Non-owners	12	84.88	1018.50		

As a result of Mann Whitney U test, which was applied to determine whether the score difference between computer owners and non-owners in privacy behavior sub-dimensional rank means was statistically significant, there was no significant difference between the rank means of general caution, technical protection and privacy concerns. Rank means of computer owners and non-owners in general caution behavior were close to one another, while rank means of computer owners in technical protection and privacy concerns were higher than non-owners. Consequently, the difference between rank means of computer owners in technical protection and privacy concerns and rank means of non-owners in technical protection and privacy concerns was in favor of computer owners.

3.4. Findings of Frequency of Internet Use Effect

92,7% (N=190) of the students included in the study had domestic internet access. Again, 27.3% (N= 56) of them stated that they were provided with school internet access, 16.6 (N= 34) with internet café access and 22.9% (N= 47) with internet access through their connections. Kruskall Wallis test was used to determine whether the students' scores of general caution, technical protection and privacy concerns varied according to frequency of internet use. The results are presented in Table 4. As it is clear from Table 4, there was no significant difference between the score means of general caution and privacy concerns according to frequency of internet use, but there was a significant difference between the score means of technical protection χ^2 (df=2, n=187) = 9.530, $p<.01$. This finding shows that frequency of internet use has a different effect on increasing technical protection behaviors of students. When the arithmetic mean of frequency of internet use was considered, those who daily used the internet displayed maximum technical protection behaviors, which was followed by those who used the internet a few days a week and a few days a month.

Table 4. Kruskall Wallis Test results for score differences of general caution, technical protection and privacy concerns according to frequency of internet use

Variables		N	M	SD	df	χ^2	P	Significant Difference
General Caution	a) Every day	141	19.93	4.04	2	.697	.706	
	b) A few days a week	51	19.49	3.69				
	c) A few days a month	5	19.00	5.39				
Technical Protection	a) Every day	135	42.67	7.08	2	9.530	.009*	a>c
	b)A few days a week	47	43.02	7.15				b>c
	c) A few days a month	5	27.00	10.77				
Privacy Concerns	a) Every day	143	88.19	18.25	2	1.734	.420	
	b) A few days a week	51	91.94	14.51				
	c) A few days a month	5	84.40	11.78				

*P<.01

Mann Whitney U test was applied to comparatively test the paired groups to see between which groups the difference between the score means of technical protection according to frequency of internet use was. As a result of analysis, it was observed that the differences between the technical protection score mean of those who daily used the internet (M=42.67) and that of those who used the internet a few days a week (M=27.00) were in favor of daily internet users. Again, the differences between the technical protection score mean of those who used the internet a few days a week (M=43.02) and that of those who used the internet a few days a month (M=27.00) were in favor of the students who used the internet a few days a week.

3.5. Findings of Internet Usage Skills Effect

Kruskall Wallis test was applied to determine whether the students' scores of general caution, technical protection and privacy concerns varied according to internet usage skills. The results are presented in Table 5. As it is clear from Table 5, there was no significant difference between the score means of general caution and privacy concerns according to internet usage skills, but there was a significant difference between the score means of technical protection χ^2 (df=2, n=187) = 23.183, p<.001. This finding shows that internet usage skills have a different effect on increasing technical protection behaviors of students. When the arithmetic mean of internet usage skills was considered, those who had expert skills displayed maximum technical protection behaviors, which was followed by those at advanced level and moderate level.

Table 5. Kruskall Wallis Test results for score differences of general caution, technical protection and privacy concerns according to internet usage skills

Variables		N	M	df	χ^2	P	Significant Difference
General Caution	a) Moderate	100	19.29	2	4.028	.134	
	b)Advanced	87	20.13				
	c) Expert	10	21.90				
Technical Protection	a) Moderate	91	39.84	2	23.183	.000*	a<b
	b) Advanced	87	44.28				a<c
	c) Expert	9	49.00				b<c
Privacy Concerns	a)Moderate	100	91.26	2	2.397	.302	
	b)Advanced	90	86.78				
	c) Expert	9	87.33				

*P<.001

Mann Whitney U test was applied to comparatively test the paired groups to see between which groups the difference between the score means of technical protection according to internet usage skills was. As a result of analysis, it was observed that the differences between the technical protection score mean of those who had

moderate internet usage skills (M=39.84) and that of those who had advanced internet usage skills (M=44.28) were in favor of those with advanced skills. Again, there were significant differences between the technical protection score mean of those who had moderate internet usage skills (M=39.84) and that of those who had expert internet usage skills (M=49.00), which were in favor of those with expert internet usage skills.

4. Result and Discussion

There was no significant difference in the evaluation of findings of privacy concern scores according to gender. However, the female students' general caution and technical protection scores were lower than the male students, but privacy concern scores were higher than the male students. This case is a result of lower general caution and technical protection scores of the female students. Hence, it is thought that further gender studies with different samples will contribute to enlighten the gender effect on privacy behaviors.

When the findings of privacy behaviors of students according to program type were considered, it was clear that graduates of philology program displayed privacy behaviors more than graduates of mathematics, physics-chemistry-biology and social studies. There was no significant difference between the technical protection score means according to program type, but there was a significant difference between the privacy concern score means. The difference was between the students of social studies and the students of mathematics program. When the literature is reviewed, it is expected that privacy precaution behavior scores (general caution and technical protection) of students from technical and technological based programs will be higher those from social studies and humanities as the former group members are more aware of hidden internet threats. Again, it is expected from the former group members to have lower privacy concerns (Buchanan, Paine, Joinson, and Reips, 2007). Although the findings of the study are parallel to the research results in the literature, in some cases, as in the present study, privacy concern scores are different while privacy behavior precaution score means are close to one another. This case is thought to be caused by the fact that branch teaching non-thesis master programs do not reflect students of different based programs, although it could converge students. As a result, further studies with different samples reflecting social studies and humanities as well as technical and technological programs are recommended.

When the findings of privacy concern variety according to computer ownership were considered, there was no significant difference although the rank means of the non-owners were lower than the computer owners in terms of general caution, technical protection and privacy concerns. The reason for that is school internet access, café internet access, mobile phone internet access and internet access opportunities through connections although students do not have computers. When the findings of privacy concern variety according to frequency of internet use were considered, there was no significant difference in general caution and privacy concerns, but there was a significant difference in technical protection behaviors. Accordingly, the technical protection behavior score means of daily internet users and those who used the internet a few days a week were higher than the technical protection behavior score means of the students who used the internet a few days a month. Despite this, the privacy concern score means of the latter group members were lower than the others. It could be caused by the fact that non-owners and rare users do not view hidden internet threats as risks.

When the findings of privacy concern variety according to internet usage skills were considered, there was no significant difference in general caution and privacy concerns, but there was a significant difference in technical protection behaviors. Accordingly, the technical protection behavior score means of the expert users were higher than those of the students with advanced or moderate skills. The technical protection behavior score means of the advanced users were higher than the users with moderate skills. Thus, the privacy concern score means of the expert and advanced users were higher than the users with moderate skills. This finding is parallel to the assumption that students with high general caution and technical protection scores will have lower privacy concern scores (Buchanan, Paine, Joinson, and Reips, 2007; Joinson and Paine, 2007; Joinson, Reips, Buchanan and Paine, 2008).

As a result, it can be said that students vary in terms of general caution and privacy concerns according to program type, and in terms of technical protection according to frequency of internet use and internet usage skills, but all of them have similar behaviors in privacy concerns.

References

Buchanan, T., Paine, C., Joinson, A. and Reips, U- D. (2007). Development of measures of online privacy concern and protection for use on the Internet. *Journal of the American Society for Information Science and Technology, 58,* 157-165. Retrieved 25 May 2010 from :http://www.joinson.com/

Büyüköztürk, Ş. (2010). Sosyal Bilimler İçin Veri Analizi Elkitabı. Pegem A Yayıncılık, Ankara

DeCew, J., (1997). In Pursuit of Privacy: Law, Ethics, and the Rise of Technology. Ithaca: Cornell University Press Retrieved 25 May 2010 from http://site.ebrary.com/lib/ankarauniv/

Dinev, T.,&Hart, P. (2004). Internet privacy concerns and their antecedents – Measurement validity and a regression model. *Behaviour and Information Technology, 23*, 413–423. Retrieved 25 May 2010 from http://site.ebrary.com/lib/ankarauniv/

Joinson, A.N. & Paine, C.B. (2007). Self-Disclosure, Privacy and the Internet. In A.N. D. Reips (Eds). Oxford Handbook of Internet Psychology (pp. 237-252). Oxford University Press. Retrieved 25 May 2010 from :http://www.joinson.com/

Joinson, A.N., Reips, U-D., Buchanan, T.B., & Paine Schofield, C.B. (in press). Privacy, Trust and Self-Disclosure Online. In press, Human-Computer Interaction. July 2008. Retrieved 25 May 2010 from :http://www.joinson.com/

Waldo, James; Lin, Herbert; Millett, Lynette I.(2007). Engaging Privacy and Information Technology in a Digital Age. Washington, DC, USA: National Academies Press, Retrieved 25 May 2010 from http://site.ebrary.com/lib/ankarauniv/

Efe, R. (2009). Science student teachers attitudes towards reflective practice: differences in subjects and grades. Cypriot Journal of Educational Sciences, 4(2), 72-86.

Ozkan, H., & Arikan, A. (2009). Internet censorship in Turkey: University students' opinions. World Journal On Educational Technology, 1(1). 46-56.