

## IT Ethics: Undergraduates' Perception Based on their Awareness

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### Abstract

Vide acceptance and use of computer and information technology in universities demanded the researchers and teachers to train their students to use these resources ethically. In the universities of Pakistan, computer and IT related courses have recently been included as compulsory subjects. Therefore, this research aimed to explore the perceptions about ethical use of information technology (IT) by the undergraduate students from four different public and private sector universities. A questionnaire was designed in which different computer and internet related activities were given and students were required to respond in terms of Right, Wrong and Neither Right Nor Wrong. Total 542 students participated in the study and the results were interpreted on the bases of their demographic information. It was concluded that majority of the students were not previously trained and have no knowledge about computer or IT ethics. It was found that female students, students from public sector universities, from different departments of computing and IT and from the disciplines of pure sciences were perceptually more positive regarding the ethical use of IT resources. Minimal differences were found across the responses of students who have IT training certificates and prior knowledge of IT ethics. This suggests that computer ethics awareness training is needed for university students.

**Keywords:** Computer ethics, IT ethics, Undergraduate Students, Education, Sciences vs Social Sciences, Male vs Female, Public-sector vs Private-sector universities.

### 1. Introduction

Ethics are not similar to etiquettes or manners neither skills nor knowledge that might be necessary to undertake an occupation (Alexandra & Miller, 2010) but in fact, in simple words, ethics is the question of right and wrong in human conduct (Benn, 1998; Kizza, 2003). Advances in computer technology influenced by human conduct (McCarthy, Halawi, Aronson, 2005) therefore, there is required to expand the definition of ethics to meet the constantly changing technology-driven landscape of human conduct. In this regard, Zeid (2009) replied that 'computer ethics deals with how to make moral decisions while using technology whether in workplace or in society in general'. The social and ethical implications of technology demand special attention and have resulted in the creation of 'ethics' (Rogerson, 1997; Goessl, 2008; Lee & Chan, 2008). Therefore, computer ethics (CE) are the ethics regarding the use of the computer and IT (Masrom, Ismail, Hussein and Mohamed, 2010) where "Cyber ethics", "Cyber Laws", "IT Ethics", and "Internet ethics" as synonym or alternative terms when associated with Internet (Bynum, 2008; Lee and Chan, 2008).

Vide acceptance and increased use of computer and information technology affected students learning in universities. When students start interacting with technology, they start operating in a new world that has unlimited access to the information which could affect either learning habits positively or negatively. Moreover, they use computer and internet to prepare notes and presentation slides, assess themselves, draw graphs and charts, email, chat and other activities during studies. In this regard Masrom, Ismail & Hussein (2008) explained that 'computer is one of the most important technological advances of 21<sup>st</sup> century and has become an essential component of teaching and learning in universities where students from all disciplines using it as a research and communication tool'. The increased use of computers in education compels students to be knowledgeable about computer ethics (CE) and the related social and legal issues so the rewards of technology can be accessible to all (Ben-Jacob, 2005).

Therefore, the objective of this paper is to explore the perceptions about ethical use of information technology (IT) by the undergraduate students from different public and private sector universities of Pakistan. Where, training and use of computer and internet has been included as a compulsory subject in all the disciplines of undergraduate studies. By reviewing the literature, it was found that the area of CE was too broader and was not possible to cover all aspects of it in one study therefore at initial stage, survey was conducted to explore about what extent do undergraduate students were aware of ethical use of computer and internet.

#### 1.1. IT Ethics in Education

Lorents, Maris, Morgan and Neal (2006) explained that IT dependence across the business enterprise, increase use of system generation operation for decision making and the lack of single unified code of ethics for all IT professionals were the ignorant factors by the researchers. They were surveying students' ethical attitudes towards computer use. A survey was administered among 67 students of Management Information Systems

(MIS) course. 30 students filled the questionnaire online and 37 filled in a face-to-face mode with supplemental materials. It was required to rate the behavior described in each scenario on a 7-point Likert scale i.e., very ethical (1), ethical (2), somewhat ethical (3), questionable (4), somewhat unethical (5), unethical (6), and very unethical (7). They depicted from the results that the median rank for all activities is in the range of somewhat unethical to very unethical. Personal use of software or downloads was judged more as being just somewhat unethical as was hacking into a computer system for reasons of intellectual curiosity. Malicious activity was judged primarily in the unethical to very unethical range. Accessing other peoples records, changing code for personal gain and causing reduced response time for a company that was believed to exploit its workers and was unfriendly to the environment was viewed no more negatively than the same activity performed without malicious intent.

Masrom, Ismail, Hussein & Mohamed (2010) explained that IT advancements without integrity and ethics are pushing people towards wane i.e., gradually losing power or importance of IT applications; and at the same time the chances of unethical use increases. These misuses and abuses of computer and technologies could harm many individuals and society in terms of hacking, spam, denial of service attacks identity theft, and unauthorized duplication of software (Kuzu, 2009). It is important for educators that they should firmly educate their students about the difference between uses and abuses of IT and how could we get benefit by using it under the boundaries of ethics. Ideally, evaluating an educational contribution to ethical development would begin with finding a suitable method for measuring significant changes in students' attitudes, affective responses and behaviors between start and completion of the educational intervention (Jiggar and Strain, 2007).

Young (2009) conducted a survey to examine whether gender differences influence the degree to which individuals recognize unethical conduct in the use of information technology at work. Total 451 employees were included in the study in which 46% were male and 54% were female. The average age of males was 29 year and females were 28. Results indicated that 39% male and 38% female expressed that personal use of internet at work is not unethical. Most common activities for male respondents were personal email (78%), instant messaging (59%), online pornography (58%), music downloading (52%) and gaming (51%) the most. The least common activities used were chat rooms (22%), online auctions (24%), online shopping (24%), stock watching (8%) and internet gambling (6%). On the other hand, females were personal email (76%), instant messaging (57%), and music downloading (47%). The least common activities were gambling sites (40%), online shopping (31%), online auctions (22%), chat rooms (20%), stock watching (5%), and internet gambling (4%). Author concluded that there were no significant gender differences in the perception of unethical behavior in internet use.

Masrom, Ismail & Hussein (2009) conducted a study to investigate the ethical awareness of computer use among undergraduate students at two public sector Malaysian universities. They used questionnaire as a tool to measure 159 undergraduate students' ethical awareness of computer use. They found in their study that male students and senior undergraduate students' beliefs were clearer about ethical perceptions on computer use ethics. They recommended that universities must arrange workshops on computer ethics for all computer users in the universities and also conduct periodic computer ethics surveys to monitor the awareness of computer users on campus, as well as include a special section on computer ethics in the university training programs.

Teston (2008) reported that 48% of elementary and middle school students believe software piracy is legal. He investigated undergraduate technology students' understanding regarding software piracy. Total 237 valid subjects were involved in his study. He designed a survey instrument, which was consisted of various dilemma stories in two different sections in order to measure ethical values. Regarding the students' software piracy attitudes, he found that the attitudes of the technology education exploratory group were not significantly different from those measured originally in a general middle school population. Teston's 2002 study found 51.9% in favor of piracy acts and the present study found 52.3% in favor. The technology education students report significantly higher rates of actual piracy behaviors. General middle school students reported 45.8% for copied software CDs and 53.4% for pirated installations (Teston, 2002). In contrast, the technology education middle school students reported 68.3% for copied software and 61.6% for pirated installations, 22.5 and 8.2 increases respectively. Perhaps technology education students were simply higher consumers of software given their interests and exposure.

According to Irons (2007), 'teaching computer ethics to students requires raising the students' awareness of ethical issues providing students with the underpinning ethical theory to understand the ethical implications of their actions and providing students with the tools to analyze and evaluate ethical dilemmas'. In this regard, Masrom, Ismail & Hussein (2009) conducted a study to investigate the ethical awareness of computer use among undergraduate students at two public sector Malaysian universities. They used questionnaire as a tool to measure 159 undergraduate students' ethical awareness of computer use. They found in their study that male students and senior undergraduate students' beliefs were clearer about ethical perceptions on computer use ethics. They recommended that universities must arrange workshops on computer ethics for all computer users in the universities and also conduct periodic computer ethics surveys to monitor the awareness of computer users on

campus, as well as include a special section on computer ethics in the university training programs. Many higher educational institutions in Pakistan have incorporated IT based courses into their curriculum in order to provide knowledge of computer and IT to their students either undergraduates or graduates. As a result, these IT literate students are practically more beneficial for society. But in turn, it also increased the use of computers for illegal purpose or unethical activities such as unauthorized access and use of computer systems. In Pakistan, computer ethics or IT ethics is not offered as an individual subject, but rather the topic is integrated in some related course, such as the Computer Applications in Education and Computer Literacy courses. In this instance, computer ethics are becoming increasingly relevant topic of study. Therefore, this study was conducted to perceive the ethical awareness about proper usage of computer and IT by undergraduate students before further experimentations in this regard.

## 2. Research Hypotheses

The research hypotheses were as under:

- H1: Undergraduate students from public-sector universities showed positive ethical perceptions in the use of IT.
- H2: Undergraduate male students' have positive ethical perceptions in the use of IT.
- H3: Undergraduate students from rural areas have positive ethical perceptions in the use of IT.
- H4: Undergraduate students from the disciplines of Social Sciences have positive ethical perceptions in the use of IT.
- H5: Undergraduate students from the disciplines of computing and IT have positive ethical perceptions in the use of IT.
- H6: IT training certificates influenced positively on undergraduate students' attitude towards the ethical use of IT.
- H7: Prior knowledge of IT ethics influenced positively on undergraduate students' attitude towards the ethical use of IT.

## 3. Research Methodology

- 3.1. **Tool of the Study:** By nature the study was descriptive; therefore, a self-reported questionnaire was designed to collect data from undergraduate students during the semesters of 2011 – 12 from two public and two private sector universities (i.e., *Public Sector Universities*: Bahauddin Zakariya University (BZU) Multan & University of Education (UoE); *Private Sector Universities*: Superior Group of Colleges (Multan Campus) & Institute of Southern Punjab (Multan campus)). The research was greatly inspired by the studies of Etter, Cramer and Finn (2006), Siegfried and Ashley (2006) and Masrom, Ismail & Hussein (2009). Questionnaire had two parts, which were designed to solicit responses. Part – I was designed to collect students' demographic information which included: university, major subject in which the students were actually enrolled, gender, area, computer training certificate and prior knowledge about computer and IT ethics (see Table 1). While, Part – II was comprised of 18 statements in which respondents were required to respond for the given statement in terms of Right, Wrong and Neither Right Nor Wrong. In all statements, some activities/conditions related to the ethical use of computer and internet were given, which helped to portray their awareness about the ethical use of computer or IT.
- 3.2. **Data Analysis:** The scale was rated from 1 to 3 i.e., 1 = Right, 2 = Wrong and 3 = Neither Right Nor Wrong (NRNW). The collected responses were fed in SPSS 15.0 and were analyzed demographically. Statistically, weighted arithmetic mean, standard deviations and independent sample t-test at  $\alpha = 0.05$  were used to conclude the results. The Cronbach Alpha test was used to measure the reliability of the items in the tool. Result of the reliability test was 0.73, and hence was acceptable (Gliem and Gliem, 2003).
- 3.3. **Sampling & Respondents:** All the four universities were delimited on the bases of convenience based sampling. Regarding the private sector universities, only those were included in the study, which were recognized as degree awarding institution by Higher Education Commission Pakistan. All those undergraduate students who were in semesters 3 and 4 during January – December 2012, constituted the population of this study. These semesters were delimited because basic computer and internet training courses were compulsory for all students in these two semesters. The questionnaires were distributed among the students within their classrooms to ensure the maximum feedback, which resulted for 542. Therefore, 542 students were considered to be the sample of the study. Students' detailed response rate is given in Table 1 (see appendix). It was depicted from the table that students from public sector universities (56%), urban areas (76%), were greater in term of frequencies and percentages. But male and female students, pure sciences and social sciences and students from Languages and IT subjects

were equal quantitatively. Total 53% admitted that they have no IT training certificate and 58% disclosed that they have no prior knowledge of IT or computer ethics.

#### 4. Results

Data analyses and discussion of the result were made in the light of research hypotheses stated in the outset.

- H1: Undergraduate students from public-sector universities have positive ethical perceptions in the use of IT. Table 2 showed statistically significant results for the statements 5, 7, 8, 12 and 15 between the public (n=301) and private (n=241) sector institutions. It was portrayed from the results that average responses of public sector universities students strongly believe that chatting during examinations either through cell or internet is wrong; it is unethical to argue the teacher about an assignment which was not actually attached through an email, they were more conscious about the copy right acts of the material downloaded from the internet (Siegfried, 2004; Cohen and Cornwell, 1998) and they believe that cheap access of IT resources is one of the reasons for its misuse. Calculated values of SD showed that the responses of students from private sector universities were perceptually varying from each other as compared to public sector students, which means they were having varying attitude toward the ethical use of IT resources.

- H2: Undergraduate male students' have positive ethical perceptions in the use of IT.

It was revealed from Table 3 (see appendix) that the results were significantly different at  $\alpha=95\%$  with  $df=540$  between male (n=271) and female (n=271) undergraduate students for statements of 5, 8, 17 and 18. The difference of opinion was found in their responses as: copying and pasting essays from internet; unauthorized sharing of music and movies (Siegfried & Ashley, 2006) and copying an abstract rather reading the whole manuscript is wrong. Overall, the average responses (above 1.50 and less than 2.50) of both male and female students indicated that the activities given in the statements regarding the ethical use of IT were WRONG which in turn showed their positive attitudes towards the ethical use of IT (Young, 2009). But, averages of female students were higher than that of male students in all statements of Table 3. Calculated values of SD confirmed that female students were perceptually more integrated regarding the ethical use of IT than to male students.

- H3: Undergraduate students from rural areas have positive ethical perceptions in the use of IT.

It was depicted from Table 4 (see appendix) that the IT ethics awareness by the undergraduate students belonging to urban (n=411) and rural (n=131) areas were significantly different at  $\alpha=95\%$  with  $df=540$  for statements 3, 4, 5, 6, 9, 10, 11, 12, 15 and 18. These statements were related to software piracy and copyright act of the copied material either from internet or from printed mode. Calculated averages for the responses of urban students were higher than to the average responses of rural students and hence, were more conclusive regarding the ethical use of IT. Urban students strongly admitted that getting training or information about ethical use of computer and other IT resources is important. In statement 15, the average value of urban students were 1.54 (i.e., greater than 1.50) and slightly tended towards WRONG and average responses of rural students were 1.38 (i.e., less than 1.50) which was slightly leading towards RIGHT. The difference between the opinions of urban and rural students was due to the availability and accessibility of IT resources in their areas. But, were relatively inexpensive to purchase and use the same at their own. Therefore, they believe that economically cheap access of computer and technologies make it easier to perform different wrong activities. Overall, majority of the urban students were more conscious about copyright acts of the content either downloaded through internet or copied from printing media.

- H4: Undergraduate students from the disciplines of Social Sciences have positive ethical perceptions in the use of IT.

Table 5 (see appendix) demonstrated that the attitudinal differences between pure sciences (n=180) and social sciences (n=180) students were significantly different at  $\alpha=95\%$  with  $df=540$  for statements 9 and 15. They disclosed that it is unethical to receive an email from their friends regarding the information about the questions that they have just attempted in their examinations and now help them to make a guess for them is ethically wrong (Etter, Cramer & Finn, 2006). From the table it was clear that the average responses of pure sciences students were higher than to social sciences students and were helpful to understand their awareness in using IT resources ethically.

- H5: Undergraduate students from the discipline of Computing and IT have positive ethical perceptions in the use of IT.

Table 6 (see appendix) showed that the attitudinal differences between the students of Languages disciplines and IT were significantly different at  $\alpha=95\%$  with  $df=540$  for statements 5 and 7. The value of t-test was 0.000 in statement 11 because there was no statistical difference between the average results of their responses. The average responses of students from the disciplines of Languages were higher than to students from IT and were clearer to understand their awareness in using IT resources ethically.

- H6: IT training certificates have influenced positively on undergraduate students' attitude towards the ethical use of IT.



Table 7 (see appendix) showed that the attitudinal differences between those students who have IT training certificate and those who have not were significantly different at  $\alpha=95\%$  with  $df=540$  for statements 7, 10, 11 and 12. Although, the average responses of those students who were having IT training certificates were slightly higher than to their competitive group because the responses were also conclusive of those students who have no IT training certificates.

- H7: Prior knowledge of IT ethics have influenced positively on undergraduate students' attitude towards the ethical use of IT.

Table 8 (see appendix) illustrated that the attitudinal differences between the students who have studied and haven't studied Computer ethics or IT ethics as a subject were significantly different at  $\alpha=95\%$  with  $df=540$  for statements 3. Overall the average responses of those students who have prior knowledge of computer ethics or IT ethics were slightly better than those who have not.

## 5. Conclusions

From the above results, it was concluded that majority of the students have not received training from any educational institution for using computer, internet and other IT resources and hence therefore have no proper knowledge or information about computer or IT ethics. The results also helped to declare that students from public sector universities (H1) and from different computing and IT departments were perceptually more positive and clearer about ethical use of computer and information technological resources and hence, therefore, hypotheses H1 and H5 were accepted. On the other hand, female students, students from urban areas and from social sciences disciplines were perceptually positive and were knowledge-full about the ethical use of computer and IT resources. Therefore, hypotheses H2, H3 and H4 were rejected on the bases of the above results. Although there were no drastic differences in the calculated values of average responses of those students who have either IT training certificates or some prior knowledge about IT; even then, hypotheses H6 and H7 were accepted. These results also revealed that IT trainings and knowledge about IT ethics have not been very affected upon students' practices regarding the use of computer and IT resources.

Cohen and Cornwell (1989) suggested that integrating computer ethics topics into the computer science and information technology curricula is more effective in terms of making students aware of ethical concerns in IT. Therefore, it is highly recommended that add computer or IT ethics as a chapter, topic or sub-topic in the curricula of those subjects of undergraduate studies in which computer and IT were being taught as compulsory subjects. Moreover, special seminars, and workshops should be arranged in the universities to highlight the importance and need of knowledge and information about computer or IT ethics.

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**Appendices**

**Table 1: Overall Sampled Students' Demographic Information**

Categories	Groups	N (%)
<b>Gender</b>	Female	271 (50%)
	Male	271 (50%)
<b>Universities</b>	Public Sector	301 (56%)
	Private Sector	241 (45%)
<b>Major Subjects</b>	Pure Sciences (PS)	180 (33%)
	Social Sciences (SS)	180 (33%)
	Languages (Lang.)	091 (17%)
	Computer & IT	091 (17%)
<b>Area</b>	Rural	131 (24%)
	Urban	411 (76%)
<b>Computer or IT Training Certificate</b>	Yes	256 (47%)
	No	286 (53%)
<b>Prior Knowledge of Computer Ethics (CE)</b>	Yes	225 (42%)
	No	317 (58%)

**Table 2: Comparison of IT Ethics Awareness by Universities**

Sr. #	Statements	Public-Sector		Private-Sector		t. Test $\alpha=0.05$
		Avg.*	SD.**	Avg.	SD.	
1.	Copying original software for education purposes is:	1.36	0.630	1.27	0.487	1.888
2.	Downloading music or movies from net is:	1.75	0.775	1.76	0.856	-0.121
3.	Information about ethical use of computer and technology is important:	1.14	0.458	1.22	0.596	-1.702
4.	Buying a paper online and submitting it as your own is:	1.79	0.594	1.69	0.631	1.930
5.	Copying and pasting an essay from the Internet and submitting it as your own is:	1.79	0.594	1.69	0.625	1.996
6.	Copying file on disk/CD containing complete assignment from a friend and submitting the work with your name is:	1.88	0.415	1.83	0.486	1.412
7.	Claiming to have attached an assignment to an email when you did not – in order to have extra time to complete the work is:	1.96	0.590	1.76	0.646	3.713
8.	Carrying on an instant message conversation while taking a(n) computerized exam is:	1.98	0.547	1.81	0.610	3.434
9.	Receiving and using an email from a friend about the questions on an exam he/she just completed is:	1.73	0.539	1.75	0.595	-0.413
10.	Copying two lines from a printed source without acknowledging the source is:	1.97	0.647	1.93	0.587	0.772
11.	Copying and pasting one sentence from an online source without acknowledging the source is:	1.97	0.647	1.93	0.587	-1.136
12.	Changing a few words of paragraph copied and pasted from the internet, so that the material does not have to be cited is:	1.89	0.674	1.73	0.764	2.603
13.	Using a series of paragraphs that have been copied and pasted from a variety of internet sites to create a paper with acknowledgement to the sites in your bibliography.	1.55	0.644	1.54	0.644	0.287
14.	Using internet chat rooms to ask assignment related questions is:	1.31	0.583	1.30	0.595	0.054
15.	Economically cheap access of computer and technology makes it easier to perform different wrong activities:	1.44	0.638	1.59	0.732	-2.545
16.	Unauthorized sharing of original software with friends is:	1.90	0.496	1.85	0.591	0.904
17.	Unauthorized sharing of music and movies files with friends is:	1.98	0.594	1.97	0.785	0.224
18.	Writing a summary based on an online abstract of a journal article rather than reading the article itself is:	1.93	0.734	1.83	0.681	1.566

\* Avg. = Average\*\* SD. = Standard Deviation

Value of t Test at  $\alpha=0.05$  is 1.96

**Table 3: Comparison of IT Ethics Awareness by Gender**

Sr. #	Statements	Female		Male		t. Test $\alpha=0.05$
		Avg.*	SD.**	Avg.	SD.	
1.	Copying original software for education purposes is:	1.32	0.556	1.31	0.590	0.300
2.	Downloading music or movies from net is:	1.70	0.805	1.81	0.817	-1.537
3.	Information about ethical use of computer and technology is important:	1.21	0.559	1.15	0.487	1.310
4.	Buying a paper online and submitting it as your own is:	1.78	0.603	1.71	0.621	1.404
5.	Copying and pasting an essay from the Internet and submitting it as your own is:	1.82	0.601	1.67	0.614	2.899
6.	Copying file on disk/CD containing complete assignment from a friend and submitting the work with your name is:	1.88	0.423	1.83	0.472	1.342
7.	Claiming to have attached an assignment to an email when you did not – in order to have extra time to complete the work is:	1.90	0.587	1.84	0.656	1.035
8.	Carrying on an instant message conversation while taking a(n) computerized exam is:	1.99	0.523	1.82	0.625	3.279
9.	Receiving and using an email from a friend about the questions on an exam he/she just completed is:	1.72	0.567	1.76	0.562	-0.837
10.	Copying two lines from a printed source without acknowledging the source is:	1.99	0.605	1.91	0.634	1.524
11.	Copying and pasting one sentence from an online source without acknowledging the source is:	2.01	0.683	1.99	0.688	0.501
12.	Changing a few words of paragraph copied and pasted from the internet, so that the material does not have to be cited is:	1.83	0.705	1.80	0.733	0.478
13.	Using a series of paragraphs that have been copied and pasted from a variety of internet sites to create a paper with acknowledgement to the sites in your bibliography.	1.56	0.658	1.53	0.648	0.592
14.	Using internet chat rooms to ask assignment related questions is:	1.30	0.572	1.31	0.604	-0.365
15.	Economically cheap access of computer and technology makes it easier to perform different wrong activities:	1.47	0.654	1.54	0.713	-1.130
16.	Unauthorized sharing of original software with friends is:	1.90	0.493	1.85	0.584	1.113
17.	Unauthorized sharing of music and movies files with friends is:	2.09	0.672	1.86	0.680	3.941
18.	Writing a summary based on an online abstract of a journal article rather than reading the article itself is:	1.95	0.668	1.82	0.749	2.119

\* Avg. = Average\*\* SD. = Standard Deviation

Value of t Test at  $\alpha=0.05$  is 1.96



**Table 4: Comparison of IT Ethics Awareness by Area**

Sr. #	Statements	Rural		Urban		t. Test $\alpha=0.05$
		Avg.*	SD.**	Avg.	SD.	
1.	Copying original software for education purposes is:	1.34	0.552	1.31	0.580	0.600
2.	Downloading music or movies from net is:	1.80	0.798	1.74	0.816	0.759
3.	Information about ethical use of computer and technology is important:	1.31	0.680	1.13	0.457	3.436
4.	Buying a paper online and submitting it as your own is:	1.63	0.571	1.78	0.621	-2.410
5.	Copying and pasting an essay from the Internet and submitting it as your own is:	1.64	0.596	1.78	0.613	-2.287
6.	Copying file on disk/CD containing complete assignment from a friend and submitting the work with your name is:	1.77	0.473	1.88	0.437	-2.507
7.	Claiming to have attached an assignment to an email when you did not – in order to have extra time to complete the work is:	1.84	0.654	1.88	0.613	-0.618
8.	Carrying on an instant message conversation while taking a(n) computerized exam is:	1.84	0.666	1.92	0.551	-1.456
9.	Receiving and using an email from a friend about the questions on an exam he/she just completed is:	1.60	0.579	1.79	0.553	-3.396
10.	Copying two lines from a printed source without acknowledging the source is:	1.82	0.601	1.99	0.623	-2.638
11.	Copying and pasting one sentence from an online source without acknowledging the source is:	1.88	0.702	2.04	0.676	-2.353
12.	Changing a few words of paragraph copied and pasted from the internet, so that the material does not have to be cited is:	1.61	0.697	1.88	0.714	-3.791
13.	Using a series of paragraphs that have been copied and pasted from a variety of internet sites to create a paper with acknowledgement to the sites in your bibliography.	1.47	0.624	1.57	0.660	-1.586
14.	Using internet chat rooms to ask assignment related questions is:	1.31	0.596	1.30	0.586	0.191
15.	Economically cheap access of computer and technology makes it easier to perform different wrong activities:	1.38	0.601	1.54	0.706	-2.317
16.	Unauthorized sharing of original software with friends is:	1.84	0.493	1.89	0.555	-0.937
17.	Unauthorized sharing of music and movies files with friends is:	1.96	0.695	1.98	0.682	-0.237
18.	Writing a summary based on an online abstract of a journal article rather than reading the article itself is:	1.78	0.671	1.92	0.722	-2.015

\* Avg. = Average\*\* SD. = Standard Deviation

Value of t Test at  $\alpha=0.05$  is 1.96

**Table 5: Comparison of IT Ethics Awareness by Subjects (i.e., Pure and Social Sciences)**

Sr. #	Statements	Pure Sciences		Social Sciences		t. Test $\alpha=0.05$
		Avg.*	SD.**	Avg.	SD.	
1.	Copying original software for education purposes is:	1.31	0.542	1.28	0.542	0.486
2.	Downloading music or movies from net is:	1.82	0.785	1.72	0.779	1.281
3.	Information about ethical use of computer and technology is important:	1.26	0.617	1.12	0.426	2.483
4.	Buying a paper online and submitting it as your own is:	1.76	0.592	1.70	0.642	0.939
5.	Copying and pasting an essay from the Internet and submitting it as your own is:	1.77	0.608	1.67	0.633	1.444
6.	Copying file on disk/CD containing complete assignment from a friend and submitting the work with your name is:	1.84	0.412	1.82	0.498	0.346
7.	Claiming to have attached an assignment to an email when you did not – in order to have extra time to complete the work is:	1.88	0.556	1.82	0.713	0.907
8.	Carrying on an instant message conversation while taking a(n) computerized exam is:	1.86	0.567	1.84	0.567	0.279
9.	Receiving and using an email from a friend about the questions on an exam he/she just completed is:	1.64	0.515	1.86	0.567	-3.892
10.	Copying two lines from a printed source without acknowledging the source is:	1.91	0.645	1.95	0.637	-0.575
11.	Copying and pasting one sentence from an online source without acknowledging the source is:	1.97	0.708	1.98	0.717	-0.148
12.	Changing a few words of paragraph copied and pasted from the internet, so that the material does not have to be cited is:	1.71	0.691	1.82	0.721	-1.493
13.	Using a series of paragraphs that have been copied and pasted from a variety of internet sites to create a paper with acknowledgement to the sites in your bibliography.	1.49	0.621	1.51	0.647	-0.332
14.	Using internet chat rooms to ask assignment related questions is:	1.26	0.530	1.30	0.588	-0.754
15.	Economically cheap access of computer and technology makes it easier to perform different wrong activities:	1.36	0.575	1.54	0.727	-2.733
16.	Unauthorized sharing of original software with friends is:	1.84	0.505	1.87	0.539	-0.504
17.	Unauthorized sharing of music and movies files with friends is:	1.97	0.668	1.84	0.644	1.847
18.	Writing a summary based on an online abstract of a journal article rather than reading the article itself is:	1.84	0.678	1.83	0.766	0.073

\* Avg. = Average\*\* SD. = Standard Deviation

Value of t Test at  $\alpha=0.05$  is 1.96

**Table 6: Comparison of IT Ethics Awareness by Subjects (i.e., Languages and IT)**

Sr. #	Statements	Languages		IT		t. Test $\alpha=0.05$
		Avg.*	SD.**	Avg.	SD.	
1.	Copying original software for education purposes is:	1.30	.568	1.42	0.684	-1.297
2.	Downloading music or movies from net is:	1.75	0.851	1.70	0.888	0.341
3.	Information about ethical use of computer and technology is important:	1.12	0.468	1.20	0.542	-1.025
4.	Buying a paper online and submitting it as your own is:	1.86	0.625	1.69	0.571	1.857
5.	Copying and pasting an essay from the Internet and submitting it as your own is:	1.96	0.556	1.65	0.584	3.638
6.	Copying file on disk/CD containing complete assignment from a friend and submitting the work with your name is:	1.86	0.410	1.96	0.445	-1.559
7.	Claiming to have attached an assignment to an email when you did not – in order to have extra time to complete the work is:	2.04	0.595	1.78	0.554	3.096
8.	Carrying on an instant message conversation while taking a(n) computerized exam is:	2.01	0.568	2.00	0.632	0.123
9.	Receiving and using an email from a friend about the questions on an exam he/she just completed is:	1.80	0.542	1.64	0.624	1.903
10.	Copying two lines from a printed source without acknowledging the source is:	2.03	0.623	1.93	0.533	1.151
11.	Copying and pasting one sentence from an online source without acknowledging the source is:	2.05	0.639	2.05	0.621	0.000
12.	Changing a few words of paragraph copied and pasted from the internet, so that the material does not have to be cited is:	1.96	0.729	1.89	0.737	0.607
13.	Using a series of paragraphs that have been copied and pasted from a variety of internet sites to create a paper with acknowledgement to the sites in your bibliography.	1.62	0.969	1.65	0.673	-0.325
14.	Using internet chat rooms to ask assignment related questions is:	1.34	0.619	1.37	0.661	-0.347
15.	Economically cheap access of computer and technology makes it easier to perform different wrong activities:	1.52	0.673	1.69	0.756	-1.658
16.	Unauthorized sharing of original software with friends is:	1.91	0.551	1.92	0.601	-0.129
17.	Unauthorized sharing of music and movies files with friends is:	2.05	0.705	2.18	0.724	-1.141
18.	Writing a summary based on an online abstract of a journal article rather than reading the article itself is:	2.00	0.650	1.98	0.843	0.217

\* Avg. = Average\*\* SD. = Standard Deviation

Value of t Test at  $\alpha=0.05$  is 1.96

**Table 7: Comparison of IT Ethics Awareness Influenced by IT Training Certificates**

Sr. #	Statements	IT Certificate (Yes)		IT Certificate (No)		t. Test $\alpha=0.05$
		Avg.*	SD.**	Avg.	SD.	
1.	Copying original software for education purposes is:	1.36	0.617	1.28	0.527	1.770
2.	Downloading music or movies from net is:	1.80	0.828	1.71	0.796	1.254
3.	Information about ethical use of computer and technology is important:	1.14	0.456	1.21	0.579	-1.534
4.	Buying a paper online and submitting it as your own is:	1.74	0.629	1.75	0.598	-0.115
5.	Copying and pasting an essay from the Internet and submitting it as your own is:	1.76	0.597	1.74	0.625	0.381
6.	Copying file on disk/CD containing complete assignment from a friend and submitting the work with your name is:	1.87	0.428	1.84	0.466	0.737
7.	Claiming to have attached an assignment to an email when you did not – in order to have extra time to complete the work is:	1.94	0.617	1.81	0.622	2.434
8.	Carrying on an instant message conversation while taking a(n) computerized exam is:	1.95	0.572	1.86	0.588	1.862
9.	Receiving and using an email from a friend about the questions on an exam he/she just completed is:	1.75	0.516	1.73	0.605	0.396
10.	Copying two lines from a printed source without acknowledging the source is:	2.01	0.635	1.89	0.603	2.257
11.	Copying and pasting one sentence from an online source without acknowledging the source is:	2.07	0.674	1.94	0.691	2.142
12.	Changing a few words of paragraph copied and pasted from the internet, so that the material does not have to be cited is:	1.89	0.698	1.74	0.731	2.433
13.	Using a series of paragraphs that have been copied and pasted from a variety of internet sites to create a paper with acknowledgement to the sites in your bibliography.	1.55	0.649	1.54	0.657	0.087
14.	Using internet chat rooms to ask assignment related questions is:	1.27	0.563	1.33	0.608	-1.162
15.	Economically cheap access of computer and technology makes it easier to perform different wrong activities:	1.48	0.656	1.52	0.709	-0.687
16.	Unauthorized sharing of original software with friends is:	1.90	0.487	1.96	0.647	0.983
17.	Unauthorized sharing of music and movies files with friends is:	1.87	0.738	1.90	0.689	-0.300
18.	Writing a summary based on an online abstract of a journal article rather than reading the article itself is:	1.88	0.863	1.85	0.873	-0.506

\* Avg. = Average\*\* SD. = Standard Deviation

Value of t Test at  $\alpha=0.05$  is 1.96

**Table 8: Comparison of IT Ethics Awareness Influenced by Prior Knowledge of Ethics**

Sr. #	Statements	IT Ethics Knowledge (Yes)		IT Ethics Knowledge (No)		t. Test $\alpha=0.05$
		Avg.*	SD.**	Avg.	SD.	
1.	Copying original software for education purposes is:	1.37	0.642	1.28	0.516	1.749
2.	Downloading music or movies from net is:	1.74	0.822	1.76	0.803	-0.352
3.	Information about ethical use of computer and technology is important:	1.12	0.421	1.22	0.585	-2.154
4.	Buying a paper online and submitting it as your own is:	1.71	0.629	1.78	0.599	-1.287
5.	Copying and pasting an essay from the Internet and submitting it as your own is:	1.74	0.586	1.75	0.629	-0.205
6.	Copying file on disk/CD containing complete assignment from a friend and submitting the work with your name is:	1.87	0.463	1.85	0.439	0.474
7.	Claiming to have attached an assignment to an email when you did not – in order to have extra time to complete the work is:	1.86	0.603	1.88	0.638	-0.346
8.	Carrying on an instant message conversation while taking a(n) computerized exam is:	1.92	0.550	1.89	0.605	0.693
9.	Receiving and using an email from a friend about the questions on an exam he/she just completed is:	1.78	0.519	1.71	0.593	1.428
10.	Copying two lines from a printed source without acknowledging the source is:	2.00	0.609	1.91	0.628	1.778
11.	Copying and pasting one sentence from an online source without acknowledging the source is:	2.06	0.665	1.96	0.698	1.784
12.	Changing a few words of paragraph copied and pasted from the internet, so that the material does not have to be cited is:	1.87	0.681	1.78	0.744	1.406
13.	Using a series of paragraphs that have been copied and pasted from a variety of internet sites to create a paper with acknowledgement to the sites in your bibliography.	1.60	0.647	1.50	0.655	1.782
14.	Using internet chat rooms to ask assignment related questions is:	1.30	0.588	1.31	0.589	-0.092
15.	Economically cheap access of computer and technology makes it easier to perform different wrong activities:	1.51	0.676	1.50	0.692	0.164
16.	Unauthorized sharing of original software with friends is:	1.89	0.483	1.87	0.579	0.395
17.	Unauthorized sharing of music and movies files with friends is:	1.91	0.655	2.02	0.703	-1.808
18.	Writing a summary based on an online abstract of a journal article rather than reading the article itself is:	1.90	0.715	1.88	0.711	0.290

\* Avg. = Average \*\* SD. = Standard Deviation

Value of t Test at  $\alpha=0.05$  is 1.96



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