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Full Length Research Paper

Ethical attitudes towards the use of computer and information technology

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Computer Ethics (CE) is the direction for the use of computer and information technology (C and IT) either at workplace or in society in general. Extensive applications of C and IT alarmed the researchers and teachers in universities to integrate CE either as a subject or as a part of a subject in curriculum. Therefore, this research aimed to survey teachers' perceptions about the ethical use of computer and information technology. A questionnaire was designed in which different computer and Different computer and internet related activities were presented in the questionnaire. And it was required to respond whether the given use in the activity is, Right, Wrong or Neither Right Nor Wrong. Total 498 teachers, from two public and two private sectors universities participated in the study. The survey showed that teachers' perceptions about the ethical use of C and IT were different in terms of designation, subjects, area (i.e. residential location), computer training experiences and prior knowledge of CE. No significant differences were found between the responses of male and female teachers. Average responses of sampled teachers clarified that all teachers from different groups were literally recognize and able to differentiate between the ethical an unethical use of C and IT. But in some cases they require more knowledge or training to understand C and IT ethics.

Keywords: Computer ethics, teachers and computer ethics, IT ethics, education, university teachers.

INTRODUCTION

Computer and Information Technologies have been evolved at almost all the levels of education in Pakistan. There have been many significant developments and changes in teaching and learning techniques and materials. Government has been spending a significant amount of resources to improve the quality of education at all levels but especially at higher educational institutions. Recently, all public and private sector universities have included a compulsory course related to the basic training of internet and computer handling in all the disciplines of undergraduate studies. This will ultimately improve the standards of education and quality of teaching and learning. Moreover, teachers are preparing lectures and notes (i.e., by downloading materials from internet), constructing question papers online, emailing assignments online, online marking of assignments and answer sheets, declaring students results online, using email to send and receive feedback to and from students and also providing CDs and web links related to course content to students in the classrooms (Jamil and Shah, 2011). In this scenario i.e., the increasing importance of technology and internet raised some ethical questions which teachers and students should be aware of.

This paper will focus on the particular issues associated with the ethical use of computer and information technologies (C and IT) by the undergraduate teachers of the sampled universities. Many of the ethical issues related to the use of C and IT raised in the paper were applicable to the teaching activities that required dealing professionally and sensitively with/within students that are of concern and may have negative impact on their learning, if ignored. By addressing computer ethics within the context of teaching profession, not only expose the level of awareness among the teachers but also bring attention of higher authorities to train teachers and students in this particular direction as well, so that the C and IT resources provided by the government could be utilized properly and effectively.

The research papers, enlisted in the reference list,

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were studied again and again. Although the literature was limited but helped to understand the importance of CE or C and IT ethics and enough to convince the researchers to conduct a study in a limited range of universities to perceive the understanding of university teachers in the related areas. The area of CE or C and IT ethics was too broader and was not possible to cover all aspects of it in one study therefore at initial stage; survey was conducted by adopting the following procedures. Moreover, during the limited literature review, researchers felt difficulty in searching any research article describing the awareness of teachers about CE or C and IT ethics. Therefore, this single study will contribute in providing awareness of the teachers with respect to their demographic distribution i.e., gender, discipline, area, subject and designation simultaneously. Later to the introduction, brief literature review, research methodology, results and conclusions are provided for the readers of this paper.

Background

We live in an era of computer and information society. Most people live and work within the context of information technology (McCarthy, Halawi, Aronson, 2005). The versatility of information technology (IT) offer many potential benefits to society – its organization and citizens – but risks are also associated with it. The social and ethical implications of this technology warrant special attention and have resulted in the creation of 'ethics' (Rogerson, 1997). Generally, the term 'Ethics' is defined as 'the principles or standards of human conduct'; while in terms of 'Computer Ethics' that deals with 'how to make moral decisions while using technology whether in the workplace or in society in general' which covers legal, ethical, privacy and security issues in computer usage (Zeid, 2009). Heersmink et al., (2011) declared and define computer and information ethics (C and IE) as a branch of applied ethics emerged in 1980s that studies the social and ethical impact of information and communication technology on individuals and society. The overall goal of C and IT ethics is to integrate IT and human values in such a way that IT advances and protects human values rather than damaging them.

Although, no universally accepted ethical guidelines have been developed (Brownlow and O'Dell, 2002). But the increased use of computer and internet in university classrooms demanded by the researchers and teachers to disseminate and investigate the applications of the ethical issues related to C and IT at higher educational institutions. Access to higher education and lifelong learning in both work and leisure time are the positive pressures (Laurillard, 2002) on universities. Laurillard further explained that those involved in university teaching in this digital age must cope with the fact that the knowledge societies are creating the means by which individuals can acquire the immediate skills and knowledge. Digital skills and knowledge have significant impact on the role of teachers and teaching profession. C and IT do not only provide new tools and resources for teaching and learning; they change the knowledge itself, the ways of accessing knowledge, and they bring new concepts to our societies (Brey, 1999; Cornund).

In the same context Rolstad (2003) added that the current era, where C and IT are widely being used in educational settings, it seems reasonable and necessary to include C and IT ethics in curriculum. It is noteworthy that in Pakistan, Computer Ethics is not offered as an individual subject; rather the topic is being integrated in some courses and taught by teachers based on their own interest and knowledge. Research in the field of C and IT ethics is still neglected by the researchers in Pakistan. The legal, privacy and security issues are broader in nature and difficult to investigate in a single study (Zeid, 2009). Therefore, this study was limited to perceive university teachers' awareness about the ethical use of C and IT.

Perceptions about Computer Ethics (CE)

Rogerson (1997) quoted that 'it is a misconception to regard the Internet as a network of individuals pursuing self-indulgence, self-expression or self-improvement. Rather it should be thought of as a high level single entity where the focus is on co-operation and community'. But Wong (2012) disclosed that 'there is a mismatch between ethics taught at university to prepare new professionals for the workplace, and the types of ethical issues which they consequently confront in the workplace. That is there is a need to discover and better document the types of ethical situations that professionals actually confront, and then to communicate those effectively to the tertiary sector, so that future graduates can be better prepared to handle the types of situations that they will confront'. Following are the results, retrieved from different studies, surrounding the issues related to role and impact of CE on teaching and learning.

Woodson (2002) conducted a study to investigate students' uses and attitudes towards computer and internet ethics. One of its purposes was to determine the task based and non-task based use of computer internet by sampled students. Study was descriptive and hence survey instruments were used and statistically mode, frequency distribution and percentages were used to conclude the results. All tasks which included activities with academic intentions were related to task based use of computer and internet, while use of computers and internet by students includes activities characterized as recreational or entertainment were non-task based. They concluded that university population that frequents the computer lab show higher usage of internet for academic purposes. For non-task based categories i.e., chat, music and video download and etc, the usage rates were on

the low end of the survey scale.

Baruchson-Arbib and Yaari (2004) conducted a study to investigate the differences between plagiarism acts from printed sources and internet sources. Total 284 students completed the questionnaire. The average age of the participants was 27.7 years and comprised of 215 females and 69 males, 177 were from faculty of Social Sciences and 107 from Humanities; 154 students were from B.A level and 130 from M. A. level. Questionnaires were distributed during class hours and the respondents were required to mark for 3 options: Yes, can't decide and No. They conclude that the students were unable to distinguish printed and internet sources because they perceive the information on the internet as free for use. They suggest that it is needed to treat potential information sources separately in research, in order to gain a full understanding of the phenomenon. It is also essential to: a) perfect students' insights regarding the ethical use of online information; b) teach them how to cite internet sources properly and c) explain the importance of protecting intellectual property rights. By doing so, universities can reduce the extent of plagiarism, and particularly internet plagiarism, committed by students.

Computers are part of educational environment where students from all disciplines utilizing them as research tools and to communicate with friends and colleagues (Ben-Jacob, 2005). In the same context, Swain and Gilmore (2001) discovered that students were extremely misinformed about copyright laws and ethical issues regarding the use of computer in society. This situation highlighted the questions about the effectiveness of teaching and curriculum in these areas. Fortunately, their students have one unit on CE and copyright in a technology course during their educational programs. To measure the effectiveness of this unit, they prepared an action plan. In this plan they firstly evaluate students' prior knowledge about the unit through a survey; through survey they will determine the areas and categories that need additional instruction; on the basis of information at step 2 they will improve their curriculum; implement it and then re-evaluate the effectiveness of the lessons and the will remain continued for next upcoming students. During the study they discovered that their students were initially uninformed about copyright laws and CE. They learned that some of their units were effective while some of them needed to improve. They predict that students always show their interest in learning new concepts and skills related to technology, copyright and CE. They also suggested that these concepts must be effectively presented to ensure that our future teachers are modeling appropriate behavior for learners in an electronic information age.

Research Question

Following research question was formulated to conclude the study: What demographic factors reveal teachers' awareness about the ethical use of C and IT?

METHODOLOGY

By nature the study was descriptive; therefore, a survey tool was designed to collect data from teachers, teaching to undergraduate students in two public sectors (i.e, Bahauddin Zakariya University, Multan, Pakistan and University of Education, Multan, Pakistan) and two private sector degree awarding institutions (Institute of Southern Punjab, Multan Pakistan and Superior Group of Colleges, Multan). All items included in the questionnaire were derived after reviewing the literature. The research study of Etter, Cramer and Finn (2006) was followed while developing the questionnaire. Questionnaire was comprised of two parts. Part – I was designed to measure teachers' demographic information which included: university, major subject teaching to undergraduate students, gender, area, designation, computer training certificate and prior knowledge about computer and IT ethics see(Table1).Based on these demographics information, research question was finally evaluated. While, Part – II was comprised of 18 statements in which respondents were required to respond for the given situations/activities related to computer or internet in the form of Right, Wrong and Neither Right Nor Wrong see (Table 2). The scale was rated from 1 to 3 from Right to Neither Right Nor Wrong respectively. The collected responses were fed in SPSS 15.0 and analyzed by grouping them in different categories see (Table1). Frequencies, percentages and weighted averages were used to conclude the results. The tool was piloted by 5 male and 5 female teachers in each of the 4 sampled universities to make the tool reliable. Some of the statements were dropped and rewritten before the final administration of the tool.

Universities were delimited on the bases of 'ease to approach' i.e., convenience based sampling. Only those private sector universities were included in the study, which were recognized as degree awarding institution by Higher Education Commission Pakistan. All those teachers who were involved in teaching to undergraduate students during January – December 2012, constituted the population of this study. Total 650 questionnaires were distributed among the teachers in their offices and 498 (77%) were recollected successfully after continuous and strong efforts during the session. Response rate of teachers according to their demographic information and categories is given in detail in Table 1. It was depicted

Table 1. Group – Wise Distribution of Overall Sampled Respondents

Categories	Groups	N (%)
Gender		
	Female	238 (48%)
	Male	260 (52%)
Universities		
	Public Sector	263 (53%)
	Private Sector	235 (47%)
Major Subject of Teaching		
	Pure Sciences (PS)	165 (33%)
	Social Sciences (SS)	165 (33%)
	Languages (Lang.)	84 (17%)
	Computer Information Technology (IT)	84 (17%)
Area		
	Rural	123 (25%)
	Urban	375 (75%)
Designation		
	Lecturer (Lec.)	236 (47%)
	Assistant Professor (Ass. Prof.)	151 (30%)
	Associate Professor (Asc. Prof.)	68 (14%)
	Professor (Prof.)	43 (09%)
Computer or IT Training Certificate		
	Yes	236 (47%)
	No	262 (53%)
Prior Knowledge of Computer Ethics (CE)		
	Yes	218 (44%)
	No	280 (56%)

from Table 1 that male teachers, teachers from public sector universities, teachers from urban area, lecturers, teachers who have no computer training and CE were not studied as subject or no prior knowledge were greater in term of frequencies and percentages.

RESULTS AND DISCUSSIONS

Averages in Table 3 showed that – overall sampled teachers (480 (96%), 453 (91%), 377 (76%)), male teachers (255 (98%), 252 (97%), 195 (75%)), urban teachers (365 (97%), 331 (88%), 285 (76%)), teachers from public sector universities (258 (98%), 219 (89%), 198 (75%)), teachers from different language departments (84 (100%), 73 (87%), 62 (74%))k, Professors, those who were having computer training certificates (43 (100%), 40 (93%), 33 (77%) and those teachers who have studied Computer Ethics during their student-life or from other sources (232 (98%), 213 (90%), 183 (76%)) – were slightly greater than 1.0 but less than 1.5 and hence closer to RIGHT in statements 3, 12 and 13. Frequencies and percentages of the respective statements are showed in brackets. Teachers expressed that information about ethical use of computer and IT is very important and must be followed properly. They usually share and discuss their subject matters and research problems to their colleagues and supervisors while chatting through net (Brownlow and O'Dell, 2002). Diagrams and illustrations downloaded from different web sites save their time. They usually share those web site addresses with their students so that they could download and understand by themselves.

Average responses of demographically distributed sampled teachers for statements 4, 5, 6, 10, 11, 14, 15, 17 and 18 were nearby or exactly pointing to WRONG. These statements were related to copyright acts, plagiarism and software piracy (Johnson, 2001) which are very serious computer crimes and hence were also declared as WRONG by the sampled teachers. In the same context, Baruchson-Arbib and Yaari (2004) highlighted that it is common perception about internet users that information on the internet belongs to the public domain, the use of which is unrestricted and requires no citation. And Brey (2007) explained that 'assignments handed in by students may turn out to be copied from fellow students or to be taken over, in part or in whole, from existing published works'. When data was distributed demographically, following highest frequencies and percentages of the respective

Table 2. Items Included in Part – II of the Questionnaire

Sr. #	Statements	Right	Wrong	Neither Right Nor Wrong
1	Copying original software for educational purposes is:			
2	Downloading music or movies from net is:			
3	Information about ethical use of computer and technology is important:			
4	Buying a paper online and submitting it as your own is:			
5	Copying and pasting an essay from the Internet and submitting it as your own is:			
6	Downloading a question paper from the net and administer it in your class is:			
7	Explaining a topic during lecture without quoting the author is:			
8	Downloading and using a research tool for your own research work but ignoring copy right acts is:			
9	Listing web sites that you do not use to complete a research paper in the bibliography is:			
10	Copying two lines from a printed source, in your research work, without acknowledging the source is:			
11	Copying and pasting one sentence from an online source, in your research work, without acknowledging the source is:			
12	Downloading diagrams or illustrations from web sites with complete reference is:			
13	Using internet chat rooms to ask about your subject is:			
14	Economically cheap access of computer and technology makes it easier to perform different wrong activities:			
15	Unauthorized sharing of original software with friends is:			
16	Unauthorized sharing of music and movies files with friends is:			
17	Writing a summary based on an online abstract of a journal article rather than reading the article itself is:			
18	Adding extra margins to increase the length of a paper is:			

Table 3. Weighted Arithmetic Mean of the Sampled Teachers According to their Categories/Groups

Sr. #	Overall	Female	Male	Rural	Urban	Public	Private	PS	SS	Lang.	IT
1	1.60	1.50	1.70	1.64	1.59	1.87	1.31	1.62	1.56	1.49	1.77
2	2.57	2.58	2.57	2.59	2.56	2.68	2.44	2.48	2.62	2.62	2.60
3	1.07	1.11	1.04	1.13	1.05	1.04	1.11	1.16	1.02	84 (R)	1.07
4	1.92	1.95	1.90	1.87	1.94	1.97	1.88	1.93	1.90	2.01	1.86
5	1.85	1.89	1.81	1.78	1.87	1.89	1.80	1.87	1.82	2.00	1.74
6	2.02	1.86	2.16	1.98	2.03	2.05	1.98	2.05	1.92	2.10	2.07
7	1.70	1.82	1.58	1.59	1.73	1.75	1.64	1.67	1.72	1.74	1.68
8	2.30	2.36	2.25	2.12	2.36	2.40	2.19	2.19	2.28	2.45	2.39
9	2.40	2.39	2.42	2.29	2.44	2.40	2.41	2.34	2.43	2.36	2.52
10	1.95	2.00	1.90	1.82	1.99	1.97	1.92	1.90	1.96	2.04	1.95
11	2.01	2.05	1.98	1.89	2.06	1.99	2.04	1.97	2.01	2.06	2.07
12	1.15	1.28	1.03	1.01	1.20	1.17	1.12	1.17	1.08	1.21	1.19
13	1.31	1.29	1.33	1.32	1.31	1.31	1.31	1.28	1.28	1.35	1.39
14	1.94	1.86	2.02	1.95	1.94	1.86	2.04	1.82	2.01	1.92	2.06
15	1.88	1.92	1.85	1.84	1.90	1.91	1.86	1.84	1.88	1.93	1.92
16	1.58	1.37	1.77	1.67	1.55	1.50	1.67	1.53	1.46	1.65	1.84
17	1.88	1.95	1.82	1.79	1.91	1.91	1.85	1.81	1.83	2.00	2.01
18	1.86	1.97	1.75	1.89	1.85	1.92	1.79	1.93	1.67	1.95	1.99

statements were observed, except 14 and 18:

- Overall sampled teachers: 368 (74%), 338 (68%), 337 (68%), 303 (61%), 263 (53%), 342 (69%), and 239 (48%).
- Female teachers: 181 (76%), 167 (70%), 205 (86%), 151 (63%), 127 (53%), 179 (75%), and 132 (56%)
- Urban teachers: 273 (73%), 256 (68%), 262 (70%), 228 (61%), 202 (54%), 253 (68%), and 176 (47%).
- Public sector universities: 206 (78%), 189 (72%), 195 (74%), 152 (58%), 144 (55%), 195 (74%), and 118 (45%).
- Teachers from different Languages program: 61 (73%), 62 (74%), 64 (76%), 51 (61%), 47 (56%), 60 (71%) and 48 (57%).
- Associate Professors: 48 (71%), 54 (79%), 45 (66%), 47 (69%), 34 (50%), 54 (79%), and 35 (52%).
- Teachers having Computer Training Certificates: 168 (71%), 160 (68%), 163 (69%), 139 (59%), 128 (54%), 177 (75%) and 103 (44%).
- Teachers having prior knowledge of Computer and IT Ethics (C and ITE): 157 (72%), 147 (67%), 149 (68%), 136 (62%), 122 (56%), 165 (76%) and 102 (47%).

Beside of these results, it was found that some of the percentages were greater than in other groups i.e., Rural 95 (77%) for statement 4, 89 (72%) for statement 15 and 63 (51%) for statement 17. Teachers from private sector universities: for statements 10 (151, 64%) and 17 (121, 52%). Teachers from pure sciences disciplines 130 (79%) for statement 4 and IT teachers 50 (60%) in statement 11. Professors' responses for statement 4 (35 (81%), 6 (31, 72%) and Assistant Professors in statement 11(89, 59%). Teachers having no computer training certificate 200 (76%) for statement 4, 164 (63%) for statement 10, and 136 (52%) for statement 17.

Frequencies and percentages for statements 14 and 18 were varied between RIGHT and NEITHER RIGHT NOR WRONG (NRNW). For example, overall sampled teachers for statement 14, 219 (44%) marked for RIGHT, 89 (18%) for WRONG and 190 (38%) for (NRNW). Due to these varying frequencies, the average response was projected WRONG (observations were same for all other groups of teachers). This statistical result truly represented teachers' belief. Teachers argued that although the technology is cheaper but its inexpensiveness is not the only reason of using computer and IT resources unethically, other factors may not be ignored. For statement 18, frequencies were 226 (45%) for RIGHT, 118 (24%) for WRONG and 154 (31%) for NRNW by overall sampled teachers. They revealed that paper margins are dependent to document type and position or situation where it will be used or required to submit. Although majority of the teachers marked for RIGHT but it was commonly understood by them that adding extra paper margins just to increase the paper length or size is ethically WRONG.

Average responses for statements 2, 8 and 9 were greater than 2.0 i.e., WRONG but not closer to 3.0 i.e., NRNW. They said that while writing a paper conceptually, sometimes they read more than one authors but not necessarily to quote them all in the main text. Therefore, they must be included in the reference list. Also, it is better to follow an online research tool and methodology for producing valid and reliable research outcomes (Brownlow and O'Dell, 2002). They enjoy working on computer, simultaneously downloading and listing music, which is not unethical according to them.

CONCLUSION

With the increased use of computer and information technology it is important to strengthen the awareness of C and ITE among teachers and students and universities can play vital role in generating awareness of ethical issues in the use of information technology (Brey, 2007). Therefore, a study was designed at initial level, to perceive teachers' ethical uses of computer and information technology. Average responses of sampled teachers for almost all statements lie 1.0 to 2.0 i.e., RIGHT and WRONG. These results clarified that all teachers from different groups were literally recognize and able to differentiate between the ethical an unethical use of computer and IT resources. Averages helped to portray the overall attitude of teachers and conclude the results. But the percentages (45% to 60%) of the same statements also highlight that teachers were not confidently clear in their own concepts in the relevant situations. Therefore, they are also required to upgrade their knowledge and information (Swain and Gilmore, 2001).

Statistically the differences were insignificant between the average responses of male and female teachers. But the percentages showed that female teachers were more conscious towards the ethical use of computer and IT than to male. Urban teachers' responses were closer and clearly showed their positive attitude. The reason could be the computer and IT facilities and teaching, learning environment is still not very supportive in rural areas of Pakistan. In the same directions, teachers from public sector universities, languages, professor and associate professors responses were closer to decision making boundaries i.e. 1.0 and 2.0. Also properly acquainted knowledge about computer and CE were also effective to the positive applications of C and IT ethics by the sampled teachers (Brey, 2007). Therefore, it was concluded from the percentages that female teachers, teachers from public sector universities, teachers from urban areas, associate professors, teachers from the faculty of languages, teachers who had received proper training for using C and IT resources and those who have knowledge about CE were comparatively well-aware and were using C and IT resources ethically.

After concluding the results, it is strongly recommended

that universities must provide opportunities for both teachers and students to understand and learn about CE or C and IT ethics. Universities must organize seminars, conferences, publish pamphlets, and include it as a major subject in their curriculum in order to safe our present and future.

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