

Computer Ethics: Perspectives of Contemporary Teachers

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Abstract:

The basic purpose of this research was to take an insight about the ethical utilization of computer and internet from teachers' perspective. The required data was collected through a self-developed questionnaire. Different teaching and research based activities carried out by teachers by the use of computer and internet were transformed in questionnaire format. And it was required to respond whether the given activity is either practically "Right", or "Wrong" or "Neither Right Nor Wrong" according to their personal experiences. Total 498 teachers – from two public and two private sectors universities – participated in the study. The survey showed that teachers' awareness regarding the ethical utilization of computer and internet were different in terms of designation, subjects, area (i.e., residential location), computer training experiences and prior knowledge of computer ethics. But no significant differences were found between the responses of teachers gender-wise. Average responses of sampled teachers clarified that all teachers from different groups were literally recognize and able to differentiate between the ethical and unethical use of computer and internet. But in some cases they require more knowledge or training to understand computer and internet ethics.

Keywords: Computer ethics, Teachers and computer ethics, IT ethics, Education, university teachers

I. 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., 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/from students and also providing CDs and web links related to course content to students in the classrooms (Jamil & Shah, 2011). In this scenario i.e., the

increased use of computer and internet in education has raised some questions regarding the ethical utilization of computer and internet by teachers professionally.

This paper will focus on the particular issues associated with the ethical use of computer and internet professionally by the contemporary teachers of the sampled universities. Teachers' awareness regarding the computer ethics (CE) is far most important because students consciously or unconsciously follow their teachers in many ways in their personal and professional lives. Therefore, this paper has investigated and highlighted different ethical issues related to the use of computer and internet by teachers in teaching and learning activities – which, if neglected – may have negative impact on students' moral, psychological and professional development. By addressing CE within the context of teaching profession, will 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 information and communication based resources could be utilized properly and effectively in educational institutions.

The research papers – enlisted in the reference list – were read again and again. Although the literature was limited but helped to understand the importance of CE or C&IT (Computer and Information Technologies) 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 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. 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.

II. Background

This is an era of computer and technology which has turned the world in “Global Village”. People live and work within the context of information technology (McCarthy, Halawi, Aronson, 2005). Benefits and risks both are associated with the possible and actual applications of technological based resources in all fields of life. Therefore, 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&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&IT ethics is to integrate IT and human values in such a way that IT advances and protects human values rather than damaging them.

Till now, no universally accepted ethical guidelines have been developed (Brownlow & O’Dell, 2002). But the increased use of computer and internet in university

classrooms has commanded from the researchers and teachers to investigate critically about the technological based ethical issues at higher educational institutions. Universities are under pressure by the societies for providing frequent access to higher education and lifelong learning in both work and leisure time (Laurillard, 2002). The author further expressed that university teachers in this digital age must manage this demand of the individuals from the knowledge societies to acquire the immediate knowledge and skills. In this regard, digital resources have been significantly facilitating teachers and learners to gain advance knowledge and improving practical skills. ICTs (Information and Communication Technologies) not only providing new tools and resources for teaching and learning; but they are also changing the methods of gaining and accessing knowledge itself and developing advance theories and introducing new concepts of handling the knowledge and information in our societies (Brey, 1999; Cornu, n.d.)

In the same context Rolstad (2003) added that in this age, where technological based resources are widely being used in educational settings, it seems reasonable and necessary to include knowledge about C&IT ethics in curriculum. Most importantly, it was noticed by the researchers that in the universities of Pakistan, knowledge and information regarding the importance of Computer Ethics was not being transferred seriously 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 computer ethics is still neglected by the researchers, teachers and Policy makers in Pakistan. Therefore, this research will facilitate to fill in the gap by provide information at an initial stage regarding the stated issue and will also bring the attention of authorities in this area of research. It is important to explain at this stage that this study was limited to perceive university teachers' awareness about the ethical use of C&IT resources. The advance areas of research in this field are legal, privacy and security based issues which were broader in nature and difficult to investigate in a single study (Zeid, 2009).

III. Perceptions about Computer Ethics (CE)

Chiang and Lee (2008) explained that the application of information technology (IT) in society has developed a theory of information ethics which importantly require to specify the relation between persons and information in information society. Chiang and Lee further disclosed that information ethics could provide an important conceptual framework with facilitate to understand a multitude of ethical issues arising due to new information technologies, i.e., privacy, intellectual property, filtering, censorship, the digital divide, which were fundamentally about who ought to have access to information and under what conditions. But it was revealed from the literature that it has not received significant attention among the individuals to develop ethical attitudes and behaviors towards the use of information technology (McCarthy, Halawi & Aronson, 2005). Wong (2012) added 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. Therefore, 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.

The results of this research were concluded on the basis of following research question "Whether teachers' awareness regarding ethical utilization of computer and internet is different in demographic based data analysis?"

IV. Methodology

A. Research Design

As it is explained earlier that the basic purpose of this research was to reveal teachers' awareness regarding the ethical utilization of computer and internet in their professional settings. The results of this research will facilitate the policy makers to establish rules to control 'cybercrime' issues in educational institutions where technology is being utilized to facilitate and upgrade standards of education at international level which simultaneously affecting social advancement. By characteristics this research is 'Qualitative' and 'Survey' method was opted to collect the required data. According to Gay, Mills, & Airasian (2015) 'qualitative research provide an understanding of a social setting or activity as viewed from the perspective of research participants'.

B. Population, Sample and Sampling Method

In this study, all contemporary teachers (2012-14) from 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) were involved. In all, 575 questionnaires were distributed among the targeted population; out which 498 (86%) were received successfully after a struggle. As all researchers knows very well about the busy schedule of university teachers, therefore, convenient based sampling method was used to collect the required data. The data was analyzed demographically, which is showed in Table 1 as under.

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%)

C. Research Instrument

A questionnaire was developed to collect data from the targeted population. For this, the Etter, Cramer and Finn (2006) research was followed with minor changes (i.e., social and environmental differences) at this stage. But different items included in the questionnaire were derived after reviewing the literature. 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 ethical utilization of computer and internet (Table 1). 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 (Table 2). The scale was rated from 1 to 3 from Right to Neither Right Nor Wrong respectively.

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

Sr. #	Statements	Right	Wrong	Neither Wrong	Right Nor
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:				

Sr. #	Statements	Right	Wrong	Neither Wrong	Right	Nor
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:					

The collected responses were fed in SPSS 15.0 and analyzed by grouping them in different categories (Table 1). 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.

V. Results and Discussions

Averages in Table 3 showed that – overall sampled teachers, urban teachers, teachers from public sector universities, teachers from different language departments, Professors, those who were having computer training certificates and those teachers who have studied Computer Ethics during their student-life or from other sources– were slightly greater than 1.0 but less than 1.5 and hence closer to RIGHT in statements 3, 12 and 13. During survey 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 & 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.

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

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’. Table 4 confirmed the results of Table 3 and clarify that:

Table 4: Percentage-wise Responses of the Sampled Teachers

Sr. No.	Overall Teachers (%)			Female Teachers (%)			Male Teachers (%)		
	Right	Wrong	NRNR	Right	Wrong	NRNR	Right	Wrong	NRNR
1.	47.00	45.60	7.40	50.00	50.00	0.00	44.20	41.50	14.20
2.	9.20	24.50	66.30	11.30	19.70	68.90	7.30	28.80	63.80
3.	96.40	-	3.60	94.50	-	5.50	98.10	-	1.90
4.	16.90	73.90	9.20	14.70	76.10	9.20	18.80	71.90	9.20
5.	23.50	67.90	8.60	20.20	70.20	9.70	26.50	65.80	7.70
6.	15.30	67.70	17.10	13.90	86.10	0.00	16.50	50.80	32.70
7.	30.30	69.70	-	18.10	81.90	-	41.50	58.50	-
8.	20.30	29.50	50.20	19.30	25.60	55.00	21.20	33.10	45.80
9.	15.50	28.70	55.80	14.30	32.40	53.40	16.50	25.40	58.10
10.	22.10	60.80	17.10	18.10	63.40	18.50	25.80	58.50	15.80
11.	22.90	52.80	24.30	21.00	53.40	25.60	24.60	52.30	23.10
12.	91.00	3.00	6.00	84.50	2.90	12.60	96.90	3.10	0.00
13.	75.70	17.70	6.60	76.50	18.10	5.50	75.00	17.30	7.70
14.	44.00	17.90	38.20	46.60	20.60	32.80	41.50	15.40	43.10
15.	21.50	68.70	9.80	22.00	72.40	5.70	21.30	67.50	11.20
16.	59.80	22.50	17.70	81.50	0.00	18.50	40.00	43.10	16.90
17.	31.90	48.00	20.1	24.80	55.50	19.70	38.50	41.20	20.40
18.	45.50	23.70	30.90	39.90	23.50	36.60	50.40	23.80	25.80

Overall teachers expressed that knowledge and information regarding ethical utilization of computer is important (statement 1); explaining content with the help of diagrams and illustrations downloaded from net with complete reference is ethically right (statement 12) but if not then they are ethically wrong (statement 7) and sharing knowledge with people outside/inside the country through chat rooms (statement 13) helped to compare and improve is ethically not wrong. Moreover, buying a research paper online and submitting it as your own is a worst activity if followed by the teachers (statement 4). While comparing the results gender-wise, area-wise, universities-wise and subject-wise it was found that female teachers; teachers from Urban areas; teachers from Public sector universities and teachers offering their services in Pure Science departments (i.e., Mathematics, Botany, Zoology, Chemistry and Physics) are comparatively more conscious regarding the ethical utilization of computer and internet (Table 4). Along with statements 1, 4, 7, 12 and 13 (as discussed above¹); these teachers added that copy/paste and article from the net and administering downloaded question papers are ethically wrong (statements 5 and 6), and unauthorized sharing of original software with friends is unethical (statement 15) but sharing music and movies just for entertainment is not unethical educational point of view (statement 16).

These teachers also expressed 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

¹ These results are common in all other categories as well (i.e., Area, Designation etc.). Therefore, ignored to avoid repetition in the text.

(Brownlow & O'Dell, 2002). They enjoy working on computer, simultaneously downloading and listing music, which is not unethical according to them.

VI. Conclusion

With the exaggerated utilization of computer and information technology in educational institutions, it is indispensable to strengthen the concept of ethical utilization of computer and other technological based tools among teachers and students. In this regard universities, Higher Education Commission and Policy Makers can play vital role in designing, implementing and promoting 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 and 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 & 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 CE 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 computer and technological based resources and those who have knowledge about CE were comparatively well-aware and were using computer and technological based 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 ethical utilization of computer and technology. This could be done through seminars, conferences, publish pamphlets, and include it as a major subject in their curriculum in order to protect our present and future.

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