

Awareness and Perception of Computer Ethics by Undergraduates of a Nigerian University

Olawale Oyewole *

Department of Library, Archival and Information Studies
University of Ibadan, Nigeria
E-mail: oyewolebaba01@yahoo.com

ABSTRACT

The invention of computers is one of the best things that have ever happened to mankind and undergraduate students can benefit immensely from the use of computers. However, observations have showed that in the present Nigerian society, there are a number of issues arising from unethical use of computers. Interactions with some undergraduate students revealed that a majority have fallen into the trap of unethical use of computers at one time or another. This seemingly alarming rate of unethical use of computers therefore calls for concern. A literature search has shown that awareness and perception of computer ethics have not been adequately researched within the Nigerian context. Thus, the main objective of this study was to examine the awareness and perception of computer ethics by undergraduate students in a Nigerian university. Descriptive survey research method was used and the study population was comprised of 12,894 undergraduate students of the University of Ibadan, Nigeria. The multistage random sampling technique was used to select a sample size of 292 and the questionnaire was used to collect data. Findings showed that the level of awareness of respondents on issues associated with computer ethics was high (mean=45.19). A majority of the respondents had a favorable perception of computer ethics and the most prominent factor identified that could hinder adherence to computer ethics as noted by most of the respondents was the poor economic situation of the country. Part of the recommendations was that government at all levels should provide responsible and responsive leadership.

Keywords: Awareness, perception, computer ethics, undergraduate students, Nigeria

Open Access

Accepted date: November 7, 2017
Received date: April 19, 2017

***Corresponding Author: Olawale Oyewole**
Doctoral Student
Department of Library, Archival and Information Studies
University of Ibadan, Nigeria
Email: oyewolebaba01@yahoo.com

All JISTaP content is Open Access, meaning it is accessible online to everyone, without fee and authors' permission. All JISTaP content is published and distributed under the terms of the Creative Commons Attribution License (<http://creativecommons.org/licenses/by/3.0/>). Under this license, authors reserve the copyright for their content; however, they permit anyone to unrestrictedly use, distribute, and reproduce the content in any medium as far as the original authors and source are cited. For any reuse, redistribution, or reproduction of a work, users must clarify the license terms under which the work was produced.

1. INTRODUCTION

The invention of computers is one of the best things that have ever happened to mankind. The use of computers by individuals of different callings has become a regular feature of modern life. From the field of medicine to agriculture, commerce, health, transportation, defence, and the like, there seems to be no aspect of daily living that is devoid of computer applications. Perhaps the field that has benefited immensely from the deployment of the computer is the educational sector. The use of computers has transformed the teaching and learning process and has made education more accessible, independent, interactive, and interesting. Universities provide education at the highest level and undergraduate students form a critical mass of learners in these ivory towers.

It is quite impossible for undergraduate students in this present stage of societal development to acquire knowledge without the assistance provided by the use of computers. This has been facilitated through the development of the World Wide Web and the Internet. These advancements in technology make it possible for undergraduate students to have access to myriads of electronic information resources that can be used for learning and research. Through the use of the computer, undergraduate students can also communicate with their lecturers to seek clarifications, submit assignments, and access other necessary academic information. Undergraduate students can also communicate with their colleagues through the use of computers. However, even though the use of the computer can be beneficial to these students, there is the possibility that frequent accessibility and utilization could increase the chances of unethical use of computer related devices (Jamil & Shah, 2014).

This possibility highlights the fact that even though the computer is a tool for good, it could also be used as a tool for evil. The decision of how best to use the computer by undergraduate students brings to the fore the issue of ethics. Mabawonku (2010) noted that ethics is concerned with the behaviour or conduct of individuals or groups in society. Ethics has to do with responsible living, upholding socially acceptable standards of right and wrong on issues of morality, and sticking to what is good instead of the bad (BBC, 2014). Ethics has also been viewed as the act of displaying values that are

considered universally acceptable like honesty, integrity, responsibility, respect, and caring for others. Others values include: promise-keeping, trustworthiness, fairness, and courage (Ethics at work, Pictorial, 1997, cited in CPCU Society, 2016).

The aspect of ethics that relates to the use of computers is called computer ethics. This is a branch of information ethics, which is also a subset of applied ethics. Computer ethics has become an issue as a result of the advancement witnessed in the Information and Communication Technology (ICT) sector which has made the development of computers possible (Florida, 2002). Scholars who have contributed to the definition of computer ethics are Maner (1980), Johnson (1985), Moor (1985), and Lockhorst (1998). Maner (1980) defined computer ethics as a domain of knowledge that investigates the problems relating to the ethical use of computer technology occasioned by improvements in computer technology. From the perspective of Johnson (1985), computer ethics studies the new versions of morality that the use of computers has brought about which has worsened the moral issues faced in the past, with a view to drawing attention to ordinary moral norms in this present age.

In the same year as Johnson's study, Moor (1985) gave a much broader definition of computer ethics than the two scholars quoted earlier. Moor viewed computer ethics as a field of study that is interested in filling gaps in policy and addressing the conceptual issues associated with the social and ethical use of information technology; while Lockhorst (1998) also expanded the definition provided by Moor by stating that computer ethics deals with the identification and analysis of the impact that information technology has on social and human values exemplified by health, wealth, work, opportunity, freedom, democracy, knowledge, privacy, security, self-fulfilment, and the like. Furthermore, Kling (1999) identified the thrust of the definitions provided by Maner, Johnson, and Moor. Kling opined that Maner acknowledged that the advent of computers has brought ethical problems, while Johnson was of the view that computers just brought a new dimension to old problems. For Moor, the concern was the issue of social and ethical uses of the new technology.

Over the years, the definition of computer ethics has grown. Kizza (2002) and Kuzu (2009) viewed computer ethics as a dynamic and complicated field of study

involving facts, concepts, policies, and values regarding rapidly increasing computer technologies. It focuses on human activities influenced or directed by use of computer technologies. In order to fully comprehend what computer ethics is about, Hissom (2006) provided the ten commandments of computer ethics. These are: Thou shalt not steal mouse balls; thou shalt not use computers to harm other people; thou shalt not interfere with other people's computer work; thou shalt not snoop around in other peoples' computer files, and; thou shalt not use a computer to steal. Others include: Thou shalt not use a computer to bear false witness; thou shalt not copy or use software for which you have not paid (or been given authority to do so); thou shalt not appropriate other people's intellectual output; thou shalt think about the social consequences of the program you are writing or the system you are designing; and thou shalt always use a computer in ways that insure consideration and respect for your fellow humans.

Masrom, Ismail, and Hussein (2008) averred that ethics of computer usage is an issue that is on the front burner. This was stated some years ago, and presently issues arising from the use of computers are still being discussed. Abolarinwa, Tiamiyu, and Eluwa (2015) expressed that humans today live in a borderless world where national boundaries have been broken down as a result of the computer revolution, which has facilitated the ease at which illegal activities such as spamming, privacy, hacking, and attacking of computers through viruses are being perpetrated in cyberspace by computer criminals. Undergraduate students, if not careful, also run the risk of computer addiction, plagiarism and personal identity theft, financial theft, and exposure to pornography. If undergraduate students are exposed to any of this, it could affect them psychologically and also impact their academics negatively.

In order for undergraduate students to use computers in ways that will not be detrimental, they need to be aware of the various ethical issues arising from the use of computers. Their perception of these issues is also very critical to determine their mental disposition towards computer ethics. This will go a long way to provide insights into their likely attitudes toward the issue of computer ethics. It is based on this backdrop that this study is set to empirically examine the awareness and perception of computer ethics by undergraduate students.

2. STATEMENT OF THE PROBLEM

Undergraduate students can benefit immensely from the use of computers. On the other hand, they could also harm themselves through their use if ethical procedures are not applied. Observations have showed that in the present Nigerian society, there are a number of issues arising from unethical use of computers. These include Internet fraud, popularly called in Nigerian parlance *Yahoo Yahoo*, identity theft, plagiarism, pornography, and the like. Interactions with some undergraduate students revealed that a majority have fallen into the trap of unethical use of computers at one time or another. This seemingly alarming rate of unethical use of computers therefore calls for concern. Could it be that undergraduate students are not aware of the fact that their use of the computer should be guided by some ethical considerations? What mental picture do they have of the various issues arising from the use of computers? A literature search has shown that awareness and perception of computer ethics have not been adequately researched within the Nigerian context. It is on this premise that this study examines the awareness and perception of computer ethics by undergraduate students in a Nigerian university.

3. RESEARCH QUESTIONS

This study will be guided by the following research questions:

1. What is the level of awareness of the issues associated with computer ethics by undergraduate students?
2. What is the perception of the undergraduate students on the issues associated with computer ethics?
3. What are the perceived factors inhibiting adherence to computer ethics by the undergraduate students?

4. LITERATURE REVIEW

The issue of computer ethics has generated quite a lot of interest from researchers from different parts of the world. Most of the existing studies ascertained the

level of awareness of undergraduate students as regards computer ethics, with some also considering the effect of gender. A review of these studies will now be presented in order to have insights, essentially into the level of undergraduate students' awareness of computer ethics.

Masrom, Ismail, and Hussein (2008) examined computer ethics awareness among undergraduate students in two universities in Malaysia, University Technology Malaysia and International Islamic University, Malaysia. 159 undergraduates were sampled with the use of a questionnaire. Results showed that most of the respondents were aware of the issues of computer ethics. The issues highlighted were privacy, property, and social impact. It is important to note that, out of the 10 items raised under these issues, the majority of the respondents noted that they were unaware of only one, which was "copy or use proprietary software for which you have not paid." The study also revealed that male undergraduates were more aware than the females.

Alhaleem, Eltayeb, and Osman (2010) studied computer ethics awareness of 102 undergraduate students of West Campus of Sudan University of Science and Technology (SUST). The respondents volunteered to participate in the study. Findings showed that a majority of the respondents were highly aware of computer ethics. They also reported just as the first study highlighted above that males were more aware than the females. The results of the study conducted by Aliyu et al. (2010) were consistent with the previous two. The study was an empirical one on computer security and ethics awareness among undergraduates in IIUM. The respondents included undergraduates in the faculty of technology and education. They reported that there were satisfactory levels of awareness among the students even though the students of technology had higher levels of awareness than the education students due to the courses on security and ethics that they offered. Results also showed that male students had a higher level of awareness than the females, but males reported a higher level of violation than the females.

Acilar and Yoruk (2010) investigated gender differences in computer ethics among the business administration students of the University of Galati. The convenience sampling technique was used to obtain the data for the study and a total of 307 fulltime students participated in the study. The results of the study were

not surprising; just as the previous studies reported, the male students indicated a higher level of awareness on the items that were used to measure awareness of computer ethics than the female students. The studies reviewed so far have showed clearly that there is a correlation between gender and awareness of computer ethics, though this study is not set out to establish that.

Iyadat et al. (2012) examined university students and ethics of computer usage at the Hashemite University, Jordan. The population consisted of 210 students and data were collected through the use of a questionnaire. The levels of awareness about computer technology ethics were interpreted as follows: below 3= low awareness level; 3-4= medium awareness level; above 4= high awareness level. The overall computer ethics result was 3.65. This indicates that the awareness of the students was at a medium level. Verccio (2016) also explored computer ethics awareness by technology students of the Leyte Normal University, Tacloban City, Philippines. Findings showed that the respondents were aware of most of the computer ethics indicators. Only cyberbullying recorded a mean of 3.47 indicating "moderately aware." As for other computer ethics indicators like cybersquatting, domain squatting, and espionage, the respondents noted that they were less aware of them.

Some recent studies have also reported on undergraduates' awareness of issues associated with computer ethics. Asanan, Hussain, and Laidey (2017) conducted a study on awareness of cyberbullying by 120 undergraduates in three private universities in Malaysia. The instrument used for data collection was a self-reporting questionnaire. The authors reported that a majority of the respondents (85.8%) indicated that they were aware of cyberbullying, 11.7% of the undergraduates were not sure as to their awareness of cyberbullying, and the rest (2.5%) were affirmative in stating that they were not aware. The forms of cyberbullying that most of the respondents were aware of included: mean or hurtful statements (26.7%), posting mean and hurtful pictures or video of someone (25.8%), spreading rumors about someone (25.0%), and hacking into an account on pretense (16.7%). From this study, it can be concluded that the level of awareness of cyberbullying, which is an issue relating to computer ethics, is high.

Louw (2017) examined how students and staff of the North-West University Potchefstroom, South Africa

perceive plagiarism facilitated by the use of computers, which was described in the study as a grey concept. The students that participated in the study were 2,414 in number. A questionnaire that passed through face validity was used to collect data. Results showed that most of the respondents were aware of the various acts that constituted plagiarism. Specifically, 98.7% of the students were fully aware that the act of copying direct from a source like the Internet without providing references is plagiarism. In addition, a significant number of the respondents (96.2%) noted that they were aware that if an individual buys a paper and submits it as if it were originally written, it is plagiarism. Also, 92.6% pointed out that they were aware that when even when Google Translation is used to translate information from another person, there is still a need to give a reference. To do otherwise was viewed by the students as plagiarism.

Within the Nigerian context, Tella and Oyeyemi (2017) conducted a study on undergraduates' knowledge of copyright infringement (an act depicting unethical use of the computer) in University of Ilorin, Nigeria. A survey research design was adopted and the sample size for the study was 372. The questionnaire was the research instrument used for data collection from the undergraduates across twelve faculties in the university. Results on the awareness of copyright infringement showed that most of the respondents, 171 (47.2%), indicated that they were aware of the act of copyright infringement to some extent, 74 (20.4%) were aware with little extent, 65 (18.0%) were not aware at all and lastly, 52 (14.4%) noted that they were aware to a great extent. Thus, on the average, it can be concluded that a majority of the undergraduates were aware of copyright infringement to a reasonable extent.

The level of awareness of issues associated with computer ethics could also determine the perceptions of undergraduate students. Martin (2011) conducted a cross cultural comparison of the computer ethics of American and European information technology students. The undergraduate students that participated in the study were 319 in number and overall results showed that both the American and European students appeared to approve of such behaviors as copying software and not registering shareware. This form of perception is detrimental to computer ethics.

However, in another study, Jamil, Shah, and Tariq (2013) carried out a study on undergraduates' perceptions based on their awareness of information technology ethics in two public and two private universities. The descriptive survey research design was used and a questionnaire was used to collect data. Findings revealed that students from the public sector universities, especially those in computing and information technology departments and female students from the social sciences, were perceptually more positive and clearer about ethical use of computers and other ICT devices. These findings highlight the role that discipline might play when it comes to the perception of computer ethics.

Hasan et al. (2015) also examined the perception and awareness of 342 students in the faculty of accountancy of Universiti Teknologi MARA (UiTM), Malaysia of cybercrime and reported that students in the age group of 18-23 years old had lower perception than those aged 24 years and above. The researchers concluded that students who had high knowledge about offences had high positive perceptions of cybercrime. The implication of the results of this study is that age might have a relationship with the perception of different aspects of computer ethics by undergraduate students.

Recently, Mustapha and Ali (2017) carried out an empirical survey of academic dishonesty with particular emphasis on digital plagiarism, which is an act relating to computer ethics, among 670 undergraduates in public universities in Malaysia. The researchers made use of a questionnaire to collect data with the use of the convenience sampling technique which was viewed as suitable because data can be collected with ease from a population that is homogenous. From the results, the perception of the respondents on digital plagiarism can be determined. Findings revealed that most of the undergraduates had a moderate perception of the various acts of academic dishonesty that included digital plagiarism. This conclusion was made as a result of percentage interpretation of the data provided which classified 1-34 as low, 35-64 as moderate, and 65-100 as high. Based on this, the level of percentage of perception of the undergraduates was 57.4% which falls in the moderate bracket.

Cilliers (2017) also explored ethical issues that include software piracy, which is an aspect of com-

puter ethics, among 312 first-year undergraduates at a university in South Africa. The study made use of the quantitative survey design and a close-ended questionnaire was the tool used for data collection. Results showed that 59.3% had the view that it was either wrong or slightly wrong to copy software for educational purposes and 91.2% also felt that it was wrong to share downloaded music or movies from the Internet with friends. This is a pointer to the fact that the perception of a majority of the respondents on the issue of software piracy is one that favors the need to uphold ethics.

The study by Tella and Oyeyemi (2017) cited earlier also presented results on the perception of copyright infringement by undergraduates. Findings showed that over four-fifths or 312 (86.2%) of the respondents agreed that if an individual engages in copyright infringement, it constitutes an act that can be regarded as intellectual dishonesty. In addition, a significant number of the undergraduates, 177 (48.9%), also noted that it is very important to provide acknowledgement for any copyrighted material used for academic purposes. The implication of this result is that most of the undergraduates had a positive perception of the need to uphold ethical principles in their use of copyrighted materials.

Moreover, it is important to ascertain from literature what could prompt some individuals including undergraduate students to use computers unethically. Ceyhan and Ceyhan (2008) observed that unethical behaviours associated with computer usage may be caused by difference reasons such as economic, social, moral, and personal reasons. The study by Rahman and Sultana (2015) provided an insight into specific reasons while some undergraduate students engaged in software piracy. Convenience sampling method was used to select 120 students from two public universities in Dhaka City and results showed that the reasons highlighted by the respondents included lack of income (21.87%), weak law enforcement (21.87%), poverty (18.75%), moral degradation (18.75%), and lack of awareness of breaking the law (18.75%).

The review of literature has revealed that most of the empirical studies on computer ethics awareness and perception were done outside the African continent, as a majority of them were conducted in the Middle East. Even from the studies that were done on the African

continent, researchers in South Africa seem to have examined issues associated with computer ethics more than their counterparts in Nigeria. This reveals a gap in knowledge that needs to be filled. Computers and related devices are tools extensively used by university students in Nigeria. Therefore a need to examine awareness and perception of computer ethics by undergraduate students within the context of Nigeria is very imperative.

5. THEORETICAL FRAMEWORK

The deontological theory of ethics will guide this work. The first great philosopher to define deontological principles was Immanuel Kant (1774-1804), the eighteenth-century German founder of critical philosophy (*Britannica*, 2015). Deontology is a word that has its roots in Greek. *Deon* in Greek means duty and as such this theory emphasises the need to uphold moral duty. The theory of deontology states that people should adhere to their obligations and duties when engaged in decision making, meaning that a person will follow his/her obligations to another individual or society because upholding one's duty is what is considered ethically correct.

Lacewing (n.d) noted that deontologists believe that morality is a matter of duty, stating that individuals have the moral duties to do things which are right to do and moral duties not to do things which are wrong to do. Whether something is right or wrong does not depend on its consequences. Rather, an action is right or wrong in itself. There are two classes of duties; the first is general duties that are carried out towards anyone, like do not lie, do not murder, help people in need, and the like, while the second refers to including the duties rendered because of a particular or social relationship. The motto of deontologists as highlighted by Hartson (2002) is "do what is right, though the world should perish."

This theory is relevant to this work because the study of the awareness and perception of undergraduate students on issues associated with computer ethics is geared towards these individuals' view of the use of computers as a duty and responsibility that should not be toiled with. When the right things are done as regards computer usage, the issue of abuse or misuse

of the computer will not arise. In addition, if individuals know that they have a sense of obligation towards another person in terms of keeping to the ethics of computer use, it will be difficult to engage in computer fraud, cyber stalking, plagiarism, and the like. Thus, the extent to which individuals adhere to the theory of deontology, the more they tend to use computers appropriately by adhering to the ethics of their usage.

6. METHODOLOGY

Descriptive survey research design was used for this study. The population of study was comprised of the undergraduate students of the University of Ibadan, Nigeria. According to the data collected from the Academic and Planning Unit of the university, there are 12,894 undergraduate students in 13 faculties. In order to determine the sample size, the multistage random sampling technique was used. At the first stage, 60% of the 13 faculties was selected, with the use of the simple random sampling technique, and as a result 8 faculties were selected. The second stage of sampling involved the use of systematic random sampling to select an nth term of 2, that is, every second faculty out of the 8 was selected in the sample. At the last stage, a sampling fraction of 10% was used. This gives a sample size of 292 (Table 1). The questionnaire was the research instrument used for data collection. Data were analysed with the use of the Statistical Package for the Social Sciences (SPSS) and presented in the form of descriptive statistics of frequency counts and percentages.

7. RESULTS

A total of 292 copies of the questionnaire were administered to the undergraduate students in the four selected faculties in the University of Ibadan, out of which 251 copies were returned and found useful for analysis giving a response rate of 86%.

7.1. Demographic Characteristics of Respondents

Table 2 presents results on the demographic information of the undergraduates students, and findings show that a majority of the respondents, 137 (54.6%), were in 200 level and the least, 18 (7.2%), were 500 level students. As for age, close to half of the undergraduate students, 120 (47.8%), were between 16-20 years of age, while only 11 (4.4%) indicated that their age was 30 and older. Results also revealed that a majority of the respondents, 164 (65.3%), were females and the rest, 87 (34.7%), were males. From the findings, almost all the undergraduate students, 245 (97.6%), were single, as only 6 (2.4%) noted that they were married. Furthermore, results indicated that most of the respondents, 145 (57.8%), practiced Christianity, while 106 (42.2%) were Moslems.

7.2. Research Question One: What is the Level of Awareness of the Issues Associated With Computer Ethics by Undergraduate Students?

In order to determine the level of awareness of the issues associated with computer ethics by undergrad-

Table 1. Sample Size for the Study

Faculty	Number of students	Sample size (10%)
Basic Medical Sciences	555	56
Law	657	66
Education	1557	156
Public Health	144	14
Total		292

Table 2. Demographic Information of Respondents

Demographic Characteristics	Frequency	Percentage
Level		
100	39	15.5
200	137	54.6
300	34	13.5
400	23	9.2
500	18	7.2
Total	251	100.0
Age		
16-20	120	47.8
21-24	96	38.2
25-30	24	9.6
30 and above	11	4.4
Total	251	100.0
Gender		
Male	87	34.7
Female	164	65.3
Total	251	100.0
Marital Status		
Married	245	97.6
Single	6	2.4
Widowed	-	-
Divorced	-	-
Total	251	100.0
Religion		
Christianity	145	57.8
Islam	106	42.2
African Traditional Religion	-	-
Total	251	100.0

uate students, a test of norm was conducted. The scale between 1-21 shows that the level of awareness is low, the scale between 22-43 indicates that the level of awareness is moderate, and the scale between 44-64 shows that the level of awareness of the respondents is high. Thus, the overall mean for awareness as indicated by the responses of the undergraduate students is 45.19 which falls between the scale “44-64.” Therefore it could be deduced that the level of awareness of the issues associated with computer ethics by the undergraduate students in University of Ibadan is high (Table 3).

In particular, the computer ethical issues with the highest means in terms of awareness rate of the respondents included: fraud (mean=3.73), hack-

ing (mean=3.63), child pornography (mean=3.25), copyright and software theft (mean=3.08), and digital plagiarism (mean=2.94). On the other hand, the computer ethical issues that most of the respondents were not aware of were domain squatting (mean=2.00) and espionage (mean=2.18).

7.3. Research Question Two: What is the Perception of the Undergraduate Students on the Issues Associated with Computer Ethics?

Table 4 presents results on the perception of the respondents on the issues associated with computer ethics, and results show that a majority of them had the

perception that it would be unjust for an individual to engage in acts that violate ethical use of the computer. Findings showed that most of the undergraduate students (mean=2.06) noted that copying so many words or ideas from online sources that make up the majority of one's work, whether credit is given or not, is unjust. A significant number of the respondents (mean=2.01) affirmed that the act of learning secret information online for personal gain and other favors is unjust, while a notable number of the undergraduate students (mean=1.94) also indicated that quoting from an online source without acknowledgement is considered unjust. Other prominent acts that were also viewed as unjust by most of the respondents were the use of another person's computer without his or her permission (mean=1.82) and the act of sending

undesired electronic content for commercial purposes (mean=1.80).

7.4. Research Question Three: What are the Perceived Factors Inhibiting Adherence to Computer Ethics by the Undergraduate Students?

Table 5 showed that the most prominent factor identified by a majority of the respondents that could hinder adherence to computer ethics by the undergraduates was the poor economic situation of the country (mean=3.35). Other significant factors include: ineffective punishment measures (mean=3.33), peer pressure (mean=3.24), and lack of money (mean=3.24).

Table 3. Awareness of Issues Associated with Computer Ethics by Undergraduate Students of the University of Ibadan

Issues associated with computer ethics	Highly aware		Moderately aware		Slightly aware		Not aware		Mean	SD
	Freq.	%	Freq.	%	Freq.	%	Freq.	%		
Hacking	128	70.9	55	21.9	15	6.0	3	1.2	3.63	0.65
Fraud	208	82.9	27	10.8	7	2.8	9	3.6	3.73	0.69
Internet libel	94	37.5	60	23.9	49	19.5	48	19.1	2.80	1.14
Identity thief	105	41.8	57	22.7	54	21.5	35	13.9	2.92	1.09
Child pornography	125	49.8	74	29.5	41	16.3	11	4.4	3.25	0.88
Cyber sex	87	34.7	72	28.7	57	22.7	35	13.9	2.84	1.05
Cyber squatting	38	15.1	83	33.1	55	21.9	75	29.9	2.33	1.06
Domain squatting	27	10.8	54	21.5	62	24.7	108	43.0	2.00	1.04
Espionage	39	15.5	69	27.5	40	15.9	103	41.0	2.18	1.13
Copyright infringement	96	38.2	55	21.9	45	17.9	55	21.9	2.76	1.18
Financial thief	101	40.2	69	27.5	27	10.8	54	21.5	2.86	1.17
Cyber stalking	73	29.1	64	25.5	62	24.7	52	20.7	2.63	1.11
Cyber bullying	62	24.7	85	33.9	23	9.2	81	32.3	2.51	1.18
Spamming	87	34.7	67	26.7	39	15.5	58	23.1	2.73	1.17
Copyright and software theft	115	45.8	70	27.9	37	14.7	29	11.6	3.08	1.03
Digital plagiarism	112	44.6	63	25.1	26	10.4	50	19.9	2.94	1.16

Table 4. Perception of Issues Associated with Computer Ethics by Undergraduate Students of University of Ibadan

Statements	Very just		Just		Unjust		Very unjust		Mean	SD
	Freq.	%	Freq.	%	Freq.	%	Freq.	%		
The use of another person's computer without his or her permission	21	8.4	5	2.0	132	52.6	93	37.1	1.82	0.83
The use of the Internet to illegally obtain money online through false pretence and deception	20	8.0	12	4.8	49	19.5	170	67.7	1.53	0.91
The use of words or pictures to damage someone's reputation online	17	6.8	3	1.2	67	26.7	164	65.3	1.49	0.83
The use of another person's name or picture for financial gains and other favours	23	9.2	3	1.2	73	29.1	152	60.6	1.59	0.91
The viewing of pornography of any sort	12	4.8	26	10.4	55	21.9	158	62.9	1.57	0.86
The exchange of explicit sexual experiences online	12	4.8	30	8.0	81	32.3	138	55.0	1.63	0.83
The act of learning secret information online for personal gains	15	6.0	59	23.5	91	36.3	86	34.3	2.01	0.91
Downloading an entire book online and distributing same for financial gains without the author's permission	18	7.2	23	9.2	91	36.3	119	47.4	1.76	0.89
The use of computer and related technologies harass other individuals	12	4.8	17	6.8	120	47.8	102	40.6	1.76	0.78
Making another person's life unbearable online through continuous taunting	12	4.8	17	6.8	95	37.8	127	50.6	1.66	0.81
The act of sending undesired electronic content for commercial purposes	17	6.8	18	7.2	113	45.0	103	41.0	1.80	0.85
Quoting from an online source without acknowledgement	21	8.4	36	14.3	100	39.8	94	37.5	1.94	0.92
Copying so many words or ideas from online sources that make up the majority of one's work, whether credit is given or not	17	6.8	58	23.1	98	39.0	78	31.1	2.06	0.90
Using tables and figures downloaded online that are not derived from primary data without giving acknowledgement	12	4.8	23	9.2	118	47.0	98	39.0	1.80	0.80

Table 5. Perceived Factors Inhibiting Adherence to Computer Ethics by Undergraduate Students of University of Ibadan

Perceived inhibiting factors	SA		A		D		SD		Mean	SD
	Freq.	%	Freq.	%	Freq.	%	Freq.	%		
Peer pressure	96	38.2	124	49.4	25	10.0	6	2.4	3.24	0.72
Lack of money	104	41.4	116	46.2	19	7.6	12	4.8	3.24	0.79
Poor economic situation of the country	110	43.8	118	47.0	23	9.2	-	-	3.35	0.64
Ineffective punishment measures	105	41.8	125	49.8	21	8.4	-	-	3.33	0.63
Favouritism and nepotism of those in authority who should sanction	92	36.7	106	42.2	47	18.7	6	2.4	3.13	0.80
Absence of effective online security measures	111	44.2	102	40.6	32	12.7	6	2.4	3.27	0.77
Poor level of alertness on the part of computer users	95	37.8	130	51.8	14	5.6	12	4.8	3.23	0.76

8. DISCUSSION OF FINDINGS

Results showed that the level of awareness of the issues associated with computer ethics by the undergraduate students was high. The ethical issues of computer usage that a majority of them were familiar with included fraud, hacking, child pornography, copyright and software theft, and digital plagiarism. The reason for this high level of awareness might not be unconnected with the prevalence of these issues in society and especially within the campus of the university. It is not uncommon to sight some youths in and around the university environment in Nigeria with expensive cars bought with the proceeds of computer fraud committed via the Internet. Stories of hacking also filter in the university environment once in a while, as the viewing of pornography by some youths is also not a strange occurrence. Issues of copyright violation and plagiarism have always been subjects of discussions in some courses and forums in the university environment, especially in Nigeria. All these could have accounted for the high level of awareness that the result presented. This agrees with the findings of earlier researchers like Masrom, Ismail, and Hussein (2008), Alhaleem, Eltayeb, and Osman (2010), and Verccio (2016), where they all reported a high level of awareness of issues associated with computer ethics by their respondents.

Findings revealed that the majority of the respondents had a favorable perception of computer ethics. Most of them expressed the sentiments that copying words and ideas without giving credit is unjust and they also abhorred the act of learning secret information online for personal gain, among others. This is an indication that the majority of the respondents had the moral obligation to use the computer ethically, thereby complying with the theory of deontology. They viewed the various acts that depict the unethical use of the computer as unjust; such actions constitute a violation of what is morally acceptable when it comes to the proper use of the computer. This result corroborates the findings of Jamil, Shah, and Tariq (2013) and Hasan et al. (2015) where the responses from the undergraduate students that were sampled indicated favorable perception of computer ethics issues, though discipline and age played a part in these studies. On the other hand, Martin (2011) reported a different result from that of this study as the respondents ap-

peared to approve unethical behaviour like the act of copying software and not registering shareware.

The factors that could inhibit adherence to computer ethics as expressed by most of the respondents were the poor economic situation of the country, ineffective punishment measures, peer pressure, and lack of money. This pattern of result is not unexpected especially in a country like Nigeria where the economy at present is not favorable and where all sorts of vices tend to thrive because of the poor economic condition. It is quite easy in this type of environment for some undergraduate students to fall prey to the pressures of friends and use the computer to plagiarise and to commit financial fraud of all sorts through the Internet. This supports conclusions made by Ceyhan and Ceyhan (2008) who noted that unethical behaviours associated with the use of computers may be caused by reasons that could be economic, social, moral, or personal. This also concurs with the results of the study carried out by Rahman and Sultana (2015) where part of the reasons identified for increasing software piracy included lack of income and poverty.

9. CONCLUSION

The high level of awareness and favorable perception that a majority of the undergraduate students exhibited through their responses might be an indication that they also display a favorable attitude towards computer ethics. In line with the theory of deontology, undergraduate students need to see compliance with computer ethics as a matter of duty, regardless of type of pressure from the society and peers. If undergraduate students make use of the computer ethically, they will develop good values and virtues that will not only benefit them during their years in school, but will also prove valuable during their work life. Failure to abide by the ethics of computer usage could send these students out of the university and might set their lives on a downward spiral from which it may be very difficult to get back on track.

10. RECOMMENDATIONS

1. In order to address the problem of the poor economic situation that might lead individuals to use the computer unethically to survive, governments

at all levels should provide responsive and responsible leadership. Social safety nets of different forms depending on the financial capacity of the government should be provided to vulnerable people, including indigent undergraduate students so that they can keep their eye off computer crimes.

2. To address the issue of ineffective punishment measures, management of the universities, in collaboration with the various agencies of government that are saddled with the responsibility of ensuring that the needed punishments are meted out to violators of computer ethics, should be alive to their responsibilities. They should be firm and shun bribery and corruption.
3. The challenge of peer pressure can be tackled if undergraduate students are determined not to be influenced by friends to use the computer unethically in a way that could tarnish their image and reputation. They need to convince themselves of the benefits associated with adherence to computer ethics.
4. The problem of lack of money might be addressed if universities provide the opportunity for some undergraduate students to work part time and be paid some stipends. This could keep their minds off the unethical use of the computer to get some money.

REFERENCES

- Abolarinwa, O. L., Tihamiyu, M. A., & Eluwa, S. E. (2015). Computer ethics and security awareness behaviour of tertiary institution students in South-Western Nigeria. *IRACST-Engineering Science and Technology: An International Journal (ESTIJ)*, 5(3), 260-265.
- Acilar, A., & Yoruk, D. (2010). Gender differences in computer ethics among business administration students. *Annals of Dunarea de Jos. University of Galati*.
- Alhaleem, A., Eltayeb, R., & Osman, I. M. (2010). Computer ethics awareness. Dspace Repository. Retrieved from <http://www.repository.sustech.edu/handle/123456789/3693>
- Aliyu, M., Nahel, A., Adbullah, O., Nojeem, A., & Diyar, D. C. (2010). Computer security and ethics awareness among IIUM students: An empirical study. *Information and Communication Technology for the Muslim World (ICT4M) 2010 International Conference 13-14 Dec, 2010*.
- Asanan, Z. Z. T., Hussain, I. A., & Laidey, N. M. (2017). A study on cyberbullying: Its forms, awareness and moral reasoning among youth. *International Journal of Media and Communication*, 1(1) 1-5. Retrieved from <http://dx.doi.org/10.11648/j.ijmc.20170101.11>
- BBC. (2014). Introduction to ethics: Ethics – a general introduction. Retrieved from http://www.bbc.co.uk/ethics/.../intro_1.shtml
- Ceyhan, A. A., & Ceyhan, E. (2008). The relationships among unethical behaviour, computer usage behaviour and some personality characteristics of Turkish University students. ERIC. Retrieved from <http://www.eric.ed.gov/fulltext/ED500249.pdf>
- Cilliers, L. (2017). Evaluation of information ethical issues among undergraduate students: An exploratory study. *South African Journal of Information Management*, 19(1), a767. Retrieved from <https://doi.org/10.4102/sajim.v19i1.767>
- CPCU Society. (2016). What is ethics? Retrieved from <http://www.cpcusociety.org/about-us/ethics-awareness-toolbox/what-ethics>
- Deontological ethics. (2015). *Encyclopedia Britannica*. Retrieved from <http://www.global.britannica.com/topic/deontological-ethics>
- Floridi, L., & Sanders, J. W. (2002). Mapping the foundationalist debate in computer ethics. *Ethics and Information Technology*, 4(1), 1-9.
- Hartson, R. H. (2002). Deontological ethics. Retrieved from <http://www.courses.cs.ut.edu/professionalism-ethics/notes.html>
- Hasan, M. S., Rahman, R. A., Abdillah, S. F. H. B. T., & Omar, N. (2015). Perception and awareness of young internet users towards cybercrime: Evidence from Malaysia. *Journal of Social Sciences*, 11(4), 395-404. doi: 10.3844/jssp.2015.395.404
- Hissom, A. (2006). Computer ethics. Retrieved from <http://www.personal.kent.edu/~ahissom1/.../>
- Iyadat, W., Iyadat, Y., Ashour, R., & Khasawreh, S. (2012). University students and ethics of computer usage: Human resource development. *E-learning and Digital Media*, 9(1), 43-49. Retrieved from <http://www.wwwords.co.uk/ELEA>
- Jamil, M., Shah, J. H., & Tariq, R. (2013). IT ethics: Un-

- dergraduates perception based on their awareness. *Journal of Education and Practice*, 4(12), 110-123. Retrieved from <http://www.iitse.org>.
- Jamil, M., & Shah, J. H. (2014). Perception of undergraduates about computer and Internet ethics in Pakistan. *Nigerian Journal of Technology (NIJO-TECH)*, 33(4), 512-522. doi:10.4314/njt.v33i4.12
- Johnson, D. G. (1985). *Computer ethics* (3rd ed. 2001). New Jersey: Prentice-Hall.
- Kizza, J. M. (2002). *Ethical and social issues in the information age*. New York: Springer Verlag.
- Kling, R. (1999). What is social informatics and why does it matter? *D-Lib Magazine*, 5(1). Retrieved from <http://www.dlib.org:80/dlib/january99/kling/01kling.html>
- Kuzu, A. (2009). Problems related to computer ethics: Origins of the problems and suggested solutions. *Turkish Online Journal of Educational Technology-TOJET*, 8(2), 91-110.
- Lacewing, M. (n.d). *Kant's deontological ethics*. London: Routledge, Taylor and Francis Group. Retrieved from <http://www.alevelphilosophy.co.uk>
- Lockhorst, G. C. (1998). The digital phoenix: How computers are changing philosophy. In T. W. Bynum and J. H. Moor (Eds.), *Ethics and Information Technology*, 1(1), 67-71.
- Louw, H. (2017). Defining plagiarism: Student and staff perceptions of a grey concept. *South African Journal of Higher Education*, 31(5), 116-135. Retrieved from <http://dx.doi.org/10.28535/315-580>
- Maner, W. (1980). *Starter kit in computer ethics*. New Haven, CT: Helvetica Press (published in cooperation with the National Information and Resources Centre for Teaching Philosophy). (Originally self-published by Maner in 1978).
- Mabawonku, I. (2010). Teaching information ethics in library schools: Overview, challenges and prospects. Retrieved from <http://www.up.ac.za/.../teaching-of-information>
- Martin, N. L. (2011). Computer ethics of American and European information technology students: A cross-cultural comparison. *Issues in Information Systems*, 12(1), 77-87.
- Mason, R. O. (1986). Four ethical issues of the information age. *Management and Information Systems Quarterly*, 10(1), 5-12.
- Masrom, M., Ismail, Z., & Hussein, R. (2008). Computer ethics awareness among undergraduate students in Malaysian Higher Education Institutions. ACIS 2008 Proceedings, 41 (pp. 628-637). Retrieved from <http://www.aisel.aisnet.org/acis2008/41>
- Moor, J. H. (1985). What is computer ethics? In T. W. Bynum (Ed.), *Computers & ethics: A research framework*. *Issues in Information Systems*, 1(2), 64-69.
- Mustapha, R., & Ali, N. A. N. (2017). An empirical survey of an academic dishonesty at major public universities in recent years: The Malaysian evidence. *Asian Journal of Educational Research*, 5(3), 43-49. Retrieved from <http://www.multidisciplinaryjournals.com>
- Rahman, M. A., & Sultana, S. (2015). Software piracy in Bangladesh: The student perceptions study on two selected public universities in Dhaka City. *Manarat International University Studies*, 4(1), 148-157.
- Tella, A., & Oyeyemi, F. (2017). Undergraduate students' knowledge of copyright infringement. *Brazilian Journal of Information Studies: Research Trends*, 11(2), 38-53.
- Verecio, R. L. (2016). Computer ethics awareness: Implication to responsible computing. *International Journal of Education and Research*, 4(3), 195-204. Retrieved from <http://www.ijern.com>