

The cover features a white background with several large, curved, overlapping shapes. On the left, there are concentric arcs in shades of green and blue. On the right, there is a large, curved shape containing a vibrant nebula-like image with orange, red, and blue colors. The text is arranged in a clean, modern layout.

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Chinese college students' understanding of Internet ethical issues: A survey of awareness and attitude*

Yuelin LI[†], Ying LI & Ang LI

Department of Information Resources Management, Business School, Nankai University,
Tianjin 300071, China

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Abstract

Purpose: This study examines Chinese college students' awareness of ethical issues surrounding the use of information resources and the Internet and their attitude to these issues.

Design/methodology/approach: A survey was conducted. Two hundred questionnaires were distributed to students of 9 universities at different levels in Tianjin, China; 171 were returned. Descriptive statistics were performed to analyze the data.

Findings: The results indicate that Chinese college students usually ignored the negative influence of fake or pornographic or other indecent information, invasion of privacy and theft of confidential information, and violation of intellectual property rights. Although they could distinguish to some extent between ethical and unethical behavior, they were not concerned about others' unethical behavior on the Web. The study also indicates that gender, age, academic major and expertise in using computers were related to the students' awareness of ethical issues relating to the use of the Internet and their attitude to these issues.

Research limitations: The sample is limited to the universities in Tianjin. A larger sample, which includes colleges and universities in the western or other developing areas in China, is needed to further validate our findings.

Practical implications: The study helps educators and academic librarians better understand Chinese college students' awareness of and attitude to ethical issues surrounding the use of the Internet. It thus could assist them in the improvement of information ethics education for college students.

Originality/value: This study was one of the first empirical studies to investigate the factors influencing Chinese college students' awareness of and attitude to Internet ethical issues.

Keywords College students; Information ethics; Internet ethical issues; Ethics education; China

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[†] Corresponding author: Yuelin Li (E-mail: yuelinli@nankai.edu.cn).



1 Introduction

Information ethics, in a broad sense, refers to a system of ethical principles or moral codes that guides people to deal with the relationships between the creation, acquirement, dissemination, use and management of information. Chinese scholars have put forward different definitions of information ethics. For example, Sha & Wang^[1] pointed out that information ethics is also called information morality, which regulates the relationships between individuals or between individuals and society during the process of their coping with problems arising from creation, collection, recording, and distribution and processing of information. Zhang & Li^[2] argued that information ethics is a special superstructure established upon the economic base of a society. Based on moral standards of “right” and “wrong” conduct, information ethics maintains and regulates the relationship between information creators, information professionals and information users via social opinions, customs and individual belief. Although these scholars view information ethics from different perspectives, they have realized that it is imperative to solve the issues related to information ethics in a modern society.

With the development of the Internet, the Web has been part of human life and extended to different aspects of social life. This leads to a series of Internet-related ethical issues that need to be addressed urgently. To the real world and society, ethics or morality has been discussed for a long time and has formulated a relatively mature system in different cultures. However, the ethical system of a virtual society created by the Web has not been established yet. Due to the characteristics of the virtual Web space, such as freedom of expression, anonymity, etc., violation of ethical principles has been easier. For instance, it is more convenient for the Internet users to invade intellectual property rights and disseminate confidential information online. Some researchers have examined these issues^[3,4]. The solution to these issues, however, depends on whether Web users think about the virtual society in the right way and abide by the ethical principles. To this end, it is necessary to investigate Web users' awareness of Internet ethical issues and their attitude to these issues, as well as the factors shaping their attitude. Considering the variety of Web users, this study is only concerned with college students as Web users.

College students constitute one of the major user groups who use the Web most frequently in their life. However, though some researchers in China have realized the importance of Internet ethics, empirical studies are still lacking. As a result, we know little about the viewpoints of college students in terms of Internet ethics. This prevents educators from providing effective instruction and ethical education to the students. Therefore, this study focused on exploring college students' awareness of and attitude to Internet ethical issues as well as the factors shaping their attitude to



these issues, in order to help educators and researchers understand college students' morality level better and more effectively conduct education pertaining to Internet ethics.

2 Literature review

2.1 Internet ethics

Some theoretical issues about Internet ethics have been examined. According to Mason^[5], information ethics research should focus on 4 aspects: Privacy, accuracy, property and accessibility. That is so-called PAPA framework. He pointed out that privacy is a type of human right, which should be protected from invasion by government agencies, computer centers or network users. Nowadays, with the development of the Internet, infringement of intellectual property and privacy invasion are increasingly common. Some Chinese scholars^[6,7] attributed this phenomenon to the characteristics of the Web. That is, the Web is a public platform for information sharing and publication. Wang^[6] argued that Web-related ethical issues were rooted in "the conflict between information sharing and exclusiveness of intellectual property rights."

Freedom and lacking of regulation are important reasons that lead to ethical issues on the Web. Xie et al.^[7] pointed out that the Internet, characterized by easy publication of information, freedom of expression and anonymity, was giving people a disguise and power without the responsibility. Anyone who had access to the Internet could freely publish and disseminate information on the Web, even indecent information, without moral restraints. They added that since people had different life experience and different understanding of information ethics, they might publish fake information, pornographic information, and other "garbage" information without awareness of the ethical issues involved.

Information security is an important research concern of ethics on the Web. According to Liu^[8], cyber crime has been a tough issue facing the world. With the development of the Internet, various information crimes have drawn a wide attention, including virus dissemination on the Web, software piracy, financial fraudulence, theft of classified national security files, etc. Wen^[9] remarked that since the use of the Internet was not restricted by time or space, cyber criminals, who were well-educated and tech-savvy, were usually successful in crimes and the police could hardly take them into custody. In the U.S., only 10% cases could be cleared up and finally convicted cases were less than 3%^[9]. Meanwhile, because of the system flaws, cyber criminals created a variety of illegal software tools, such as logic bombs, worms, and so on, posing a great security challenge facing modern society. To improve information security, it may be an imperative step to create an information ethics system for the virtual society.



2.2 Internet ethics education

It is agreed that Internet ethics education is quite important for a country. Some Chinese scholars, such as Wang^[10], Ma^[11], and Sun & Yang^[12] discussed college students' awareness of Internet ethics, effectiveness of ethics education and competency in information literacy from a theoretical perspective, respectively.

International researchers, on the other hand, identified ethical issues in college students, analyzed the reasons that led to these issues and explored the possible solutions. According to Karim et al.^[13], unethical activities online were mainly concentrated on fraudulence, plagiarism, falsification, delinquency, unauthorized help and facility misuse. Concerned with Internet ethics in college education, Dadzie^[14] emphasized that the depth of education should be taken into account. In particular, some serious violations of information ethics such as plagiarism, online crime, abuse of social network, etc. deserved more attention. Bodi^[15] pointed out that plagiarism is a common issue in publication, but in the virtual environment it is more likely to happen due to vague information ownership. Students usually ignored the law and university policies about plagiarism, and librarians were always facing the challenge of academic integrity.

Moreover, education improves students' understanding of Internet-related morality problems. Chang^[16] found that the students who attended training classes in information ethics usually demonstrated better understanding of ethical principles. Aygün et al.^[17] and Chiu et al.^[18] had similar findings. Chang^[16] reported that gender was related to the effectiveness of taking information ethics class. Via training, female students understood better than male students in respecting regulation, privacy and intellectual property rights. In addition, although the participants agreed that it was wrong to invade others' privacy, they would still do so because of a lack of legal and moral restriction.

Information ethics education is part of information literacy education. Thus, it is necessary to promote information ethics education by establishing a set of standards of information literacy. For that reason, American Library Association (ALA) published a standard for students' learning information literacy in 2000, entitled *Information Literacy Competency Standards for Higher Education*^[19]. This standard was extensively revised in 2013–2014. It defines information literacy and addresses the relationship between information literacy and information technology, information literacy and higher education, and information literacy and pedagogy. It includes 5 standards with specific performance indicators and outcomes. The publication and enforcement of the standard provides a guideline for Internet ethics education for college students.



3 Research method

A survey was conducted to explore college students' awareness of ethical issues related to the use of the Internet and their attitude to these issues. The questionnaire was developed based on Mason's PAPA framework. In addition, the questions also covered information environment pollution, information security, students' awareness of responsibility, etc. After the questionnaire was developed, we conducted a pilot survey. Based on the results of the pilot study, we revised the questionnaire for making it more concise and clearer.

The sample was selected from the universities in Tianjin, China. Considering the representativeness of the sample, we categorized the universities into different levels according to the classification of universities published by the Ministry of Education of China. The universities in Tianjin were categorized into 4 levels, that is First-class A, First-class B, Second-class A and Second-class B. For different levels, students' admission score is different. In each level, we sampled part of students. Since Nankai University is a comprehensive university and covers students from different provinces in China and different academic majors, we distributed 100 questionnaires in this university and 100 questionnaires in other universities. We sent 200 questionnaires in total and 171 were returned. The return rate was 86%. All returned questionnaires were valid. Descriptive statistics were performed to analyze the data.

4 Results

4.1 Characteristics of the sample

Table 1 shows the distribution of questionnaires to different universities. The sample includes 171 students, with 33% male and 67% female; 37% of them were freshman and sophomore; 63% were junior and senior students. In terms of their academic disciplines, economics and management (EM) students accounted for 50% of the total respondents, the students from humanity 33%, and science and engineering students 17%. In addition, 61% of the total students were from cities, and the others from rural areas. Most of the students could use computers. The students who used the Web for more than 5 years accounted for over 80% of the total respondents. About 51.46% of the students have begun to use the Web since middle school. Much fewer students (6.43%) reported their first use of the Web after they entered the college. The students frequently used the Web: A majority of them (69.01%) used the Web every day and they (64.32%) would spend less than 3 hours online each time they accessed the Internet.



Table 1 Questionnaire distribution

Category	University	Distribution	Return	Return rate (%)
First-class A	Nankai University	100	93	93
	Tianjin University	12	10	83
First-class B	Tianjin University of Finance and Economics	14	14	100
	Tianjin University of Science and Technology	12	8	67
Second-class A	Tianjin Normal University	14	13	93
	Tianjin University of Traditional Chinese Medicine	12	6	50
	Tianjin Foreign Studies University	12	7	58
Second-class B	Tianjin University of Commerce	12	11	92
	Tianjin University of Technology	12	9	75
Total		200	171	86

4.2 Indecent information on the Web

Nowadays, fake, pornographic or other indecent information is easily accessible on the Internet. When they were asked what to do when they came across indecent information online, a majority of the respondents (73.68%) said they would filter the information or close the browser windows, but only 21.05% of the students said they would close the windows and report the offense. In terms of their attitude to the pornographic information online, 46.78% of the students took a relaxed attitude. They believed that there must be some reason why the related websites came into existence, but they agreed that those websites should be regulated. When facing fake information, 60% of the students made the choice: Fake information is inevitable and we just need to be careful. Only 22.22% of the students regarded that those who created or disseminated fake information were unethical and they should be stopped from doing that again.

Figure 1 shows that gender was related to the respondents' attitude toward reading fake or pornographic information. We observed that 42.98% of female students considered pornographic websites illegal and should be closed by all means, but only 21.05% of male students agreed with them. More male students (59.65%) believed that the regulation should be applied to the related websites. Moreover, the data indicates that more male students skimmed over pornographic websites than female students.

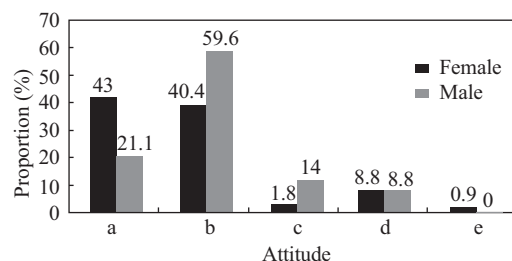


Fig. 1 Students' attitude to pornographic or fake information.

Note: a, Illegal; b, reasonable; c, browsing freely; d, don't know; e, others.



Students from different academic disciplines also understood information ethics at different levels. When facing fake or pornographic information, 81.63% of students from humanity and EM selected to filter the information or closed their browsers; only 8.16% of the students would report the offence. To the same question, 40% of students from science and engineering chose to filter the information or close their browsers, but 48% of them would report the offense. However, when they were asked about their attitude to such information, 64% of humanity and EM students and 88% of science and engineering students held the view that it was unavoidable to come across such information online. They agreed that they should be cautious when it comes to browsing such information on the Internet.

4.3 Privacy invasion

The respondents were most concerned with privacy invasion and theft of confidential information when they were using the Internet. Most students (80%) agreed that it was unethical to invade others' privacy and steal confidential information and whoever did so should be heavily punished. However, as for "human flesh search"^①, 56.73% of the students voiced their understanding to those "flesh searchers" and believed that those people must have reasons for doing so, although the process of searching involves the probing and posting of personal details.

It is noted that expertise in computer use and academic major influenced the attitude of the respondents. Among the students who had only basic skills in using computers, 85.42% agreed that the government should crack down upon theft of confidential information. Only 10.42% of them held that this phenomenon was hard to avoid and people should learn to protect their confidential information by themselves. But to the respondents who were experienced in computer use, the percentage of people who supported punishment dropped to 60.71% and that of people who opposed punishment rose to 41.07%, respectively. The results indicate that the students who were more familiar with computer use could be more tolerant with theft of confidential information. Only 29.41% of the experienced computer users found theft of confidential information and privacy invasion extremely offensive. By contrast, 40% of the respondents with basic computer use skills were strongly against such behavior. In terms of academic major, 83.67% of humanity students could not tolerate privacy invasion and theft of confidential information; only 8.16% of the students thought that such phenomenon was unavoidable. But to science and engineering students, 64% of them agreed that theft of confidential



^① The idea of human flesh search is that when cases of corruption, infidelity and injustice are exposed on the Internet, thousands of Internet users are all mobilized with one aim to dig out facts and expose the details to the public. To do this they use the Internet and conventional search engines (http://www.chinadaily.com.cn/china/2008-07/04/content_6821165.htm).

information was unavoidable, and 40% of them were in supportive of severe punishment.

4.4 Intellectual property right infringement

Regarding ethical education on college students, more attention should be paid to academic ethics. One of students' purposes of going online is to search for learning materials to complete their assignments or papers. During the process, it is easy to copy and paste materials from websites. That leads to plagiarism and fraudulence. Therefore, it is necessary to get to know students' attitude to infringement of intellectual property rights, which will help educators effectively conduct information ethics education.

It is noted that the respondents had a vague attitude to such behaviors as downloading pirated novels or movies or copying materials on the Web without a citation to the original source. On the one hand, they were clear that those behaviors violated intellectual property rights. On the other hand, however, they reasoned as all other people did that, they of course could do the same, especially downloading pirated novels or movies. This result also indicates that the students who were more excellent in using computers were more likely to support that behavior. These students viewed it as a normal behavior, which helped them save money. The data indicates that 76.47% of the respondents who were experienced in computer use regarded that behavior as "normal", and only 17% of them agreed that the behavior invaded intellectual property rights. However, to the students with basic skills in computer use, 50% of them considered it acceptable to download pirated novels or movies, whereas 10% of them regarded the behavior as violation to the intellectual property rights. The possible reason was that experienced computer users knew better about using software tools to download pirated stuff and got more benefits from that. In addition, when asked whether it was ethical to copy and paste information online without a citation to the original source, 40% of the respondents took a "neutral" attitude. The percentage was even higher among junior students and experienced computer users, above 50%.

4.5 Information security

Our investigation found that computer virus was another major concern of the respondents, following privacy invasion and theft of confidential information. To the people who develop and disseminate virus on the Internet, most respondents (80%) condemned their behavior. It is noted that students' attitude varied depending on gender and their expertise in computer use.

Figure 2 indicates that female students were more concerned with this issue than male students. We found that 20% of male students even took a neutral stance to



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this issue. This is possibly because male students, who were much more interested in computers and information technologies than their female classmates, may be curious about creating a computer virus on their own and developing anti-virus tools.

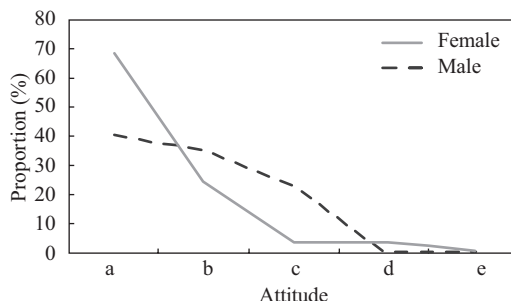


Fig. 2 Attitude to the development of virus in terms of gender.

Note: a, Extremely disagree; b, disagree; c, neutral; d, agree; e, extremely agree.

Figure 3 indicates that the respondents were less worried about computer virus if they had higher level of expertise in computer use. In terms of creating and dissemination of computer virus online, the group of respondents with basic computer use skills had the highest percentage of people who selected “extremely disagree”, followed by the group of respondents with middle-level expertise and the group of students with high level of expertise. The result may be due to the fact that the students with more skills in computer use can handle computer virus better and minimize the negative impacts of computer virus more efficiently than the students with basic skills or middle-level expertise.

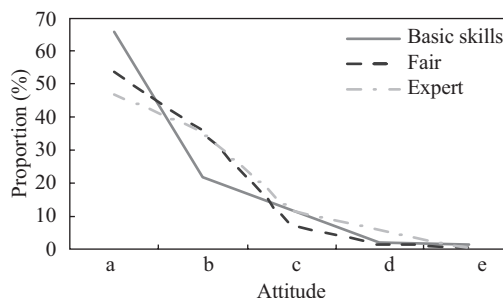


Fig. 3 Attitude to computer virus in terms of different levels of expertise in computer use.

Note: a, Extremely disagree; b, disagree; c, neutral; d, agree; e, extremely agree.

4.6 Solution to ethical issues on the Internet

To solve the ethical issues on the Internet, the respondents agreed that the general moral rules should not be violated no matter on the Internet or in the real world. They expressed the need of ethical education for college students. When they were

asked whether they would monitor others' online behavior or report others' unethical behaviors, around 60% of the students displayed a neutral attitude.

Further analysis indicates that the respondents' academic background influenced their attitude. We found that humanity and EM students took a clear-cut attitude. As illustrated in Fig. 4, much more humanity and EM students were against monitoring others' online behavior than science and engineering students. While most science and engineering students (80%) felt "neutral" about monitoring others' online behavior, only some humanity and EM students (30%) had the same attitude.

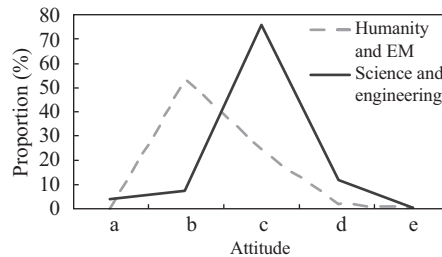


Fig. 4 Attitude of students with different majors to monitoring others' online behavior.
Note: a, Extremely disagree; b, disagree; c, neutral; d, agree; e, extremely agree.

5 Discussion

5.1 Awareness of and attitude to Internet ethical issues

In general, with the development of information technologies, the Internet has played an important role in everyday life of college students. They used the Web for similar purposes, for example, searching for learning materials, shopping, entertainment, etc. In terms of their awareness of and attitude to Internet ethical issues, the main findings of this study are summarized as follows:

- Unconcerned with fake or pornographic or other indecent information. The analysis indicates that college students in China were aware of indecent information on the Internet and capable of distinguishing between "good" and "bad" information. However, there was a general lack of enthusiasm among these students for taking actions to resist such information. Some of them, especially male students, even held a vague attitude toward indecent information. This indicates that information ethics education is imperative.
- A vague understanding of privacy invasion. Our survey indicates that college students were against privacy invasion and theft of confidential information and other materials. They agreed that such behavior should be heavily punished. This indicates that they had a correct understanding of such behavior. However, they had a different attitude when it comes to some specific issues, for example, "human flesh search". They supported those flesh searchers to uncover a



person's identity without awareness of the ethical issues involved or they chose to ignore the infringement of privacy rights of the person involved in the "human flesh search". The result supports Chang's findings^[16], that is, students would choose to search for and disseminate certain information even if it is clear to them that acquiring and disseminating the information invades others' privacy. According to Chang, students did so because they were lacking clear understanding of the law and ethical principles. Therefore, it is important for ethics course instructors to enhance students' understanding on privacy rights.

- Lacking awareness of protection of intellectual property rights. We found that college students have not realized the importance of intellectual property rights, especially when using online information. What is worse is that most of the college students in this study admitted that they once or often invaded others' intellectual property rights by directly copying and pasting others' papers or essays without acknowledgement. Among these students, some had not realized that such behavior violated the law and was unethical, while others were clear that the behavior was unethical, but they did not consider it as an important issue. Consequently, they either held a neutral attitude to academic cheating such as plagiarism and fabrication or showed tolerance to such behavior as downloading pirated novels or movies. This result supports Bodi's findings^[15] that plagiarism in writing essays is common among college students who mostly ignore the law and their universities' policies about plagiarism. It also indicates the necessity to conduct information ethics education in universities.
- Lacking awareness to maintain a healthy online environment. To the question of whether to monitor others' online behavior or report others' unethical behavior, most students would hold a neutral attitude. This indicates a lack of the sense of social responsibilities among college students.

In the survey, we found that the students held a positive attitude toward cracking down upon crimes related to the use of computers and information technologies. They were also aware of the importance of Internet ethics education and supported their universities to offer related courses.

5.2 Factors influencing students' awareness and attitude

We further examined whether gender, age, academic major, family background, expertise in computer use, and experience with online information search were related to college students' awareness of Internet ethical issues and their attitude to these issues. The descriptive statistics were performed. The results indicate that gender, age, academic major and expertise in computer use are more influential factors.



- **Gender.** More female students were found to have a sound mentality and a good sexual morality on the Internet than male students. First, regarding distributing pornographic materials and posting sexually-explicit images, female students held that these illegal activities must be cracked down upon without delay or mercy, but male students were not concerned about that issue too much. Second, as for the creation and dissemination of computer virus online, female students found that behavior unacceptable, but male students had more curiosity about computer virus software. The results support Chang's study^[16], which illustrates that female students are better than male students in understanding information ethics and abiding by ethical principles. In particular, when facing specific issues related to Internet ethics, females are superior to males in terms of judgment of what is "right" or what is "wrong", and are likely to be more sensitive to ethical issues than males.
- **Age.** We found that first- and second-year students are more strongly opposed to plagiarism than third- and fourth-year students. There may be two reasons. First, junior and senior students with heavier course load are inclined to finish their assignments in a "quicker" and more "convenient" way. Second, plagiarism happens frequently in colleges and universities. College students, who are easily influenced by the external environment, may be misled into making incorrect ethical judgment. The older the students, the more they are affected by the external environment. According to Xie et al.^[7], ethical problems in the society were caused to some degree by different personal life experience and value judgment in information and information ethics. Our study supports their findings. Therefore, it is necessary to reshape students' information ethics values and create a better cultural environment via ethics education.
- **Academic major.** As different academic disciplines adopt different ways to educate students, science and engineering students and humanity and EM students are found to be different in the ways of cognitive thinking. The former are better in practical skills, but the latter are more open to the world and know better about history and culture. The difference to some extent affects students' understanding of Internet ethical issues. In our study, although science and engineering students were more unconcerned with ethical principles and more tolerant about others' unethical behavior, they would stop unethical behavior if encountering such behavior. To humanity and EM students, although they had clearer understanding of Internet ethical issues, they were unwilling to take actions to improve the online environment. Moreover, difference was observed among students' attitude to privacy rights. Most humanity students found privacy invasion and theft of confidential information totally unacceptable



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while most science and engineering students considered such phenomenon unavoidable. Finally, they were also different in their willingness to monitor other people's unethical activities online. Humanity and EM students held a negative attitude, while science and engineering students tended to be "neutral".

- Expertise in computer use. The study found that students' expertise in using computers affects their awareness of ethical issues on the Internet and their attitude to these issues. According to this study, students who were experienced in using computers seemed more tolerant of unethical behavior, such as privacy invasion, theft of confidential information and materials, downloading of pirated novels or software tools, plagiarism, and so on. One unexpected discovery of this study is that some of the students even perceived unethical behavior understandable. It suggests that, on the one hand, since these experienced computer users knew more about the use of computers and the Internet, they had the ability to better protect their rights and benefits. On the other hand, they could use more software tools and get more benefits from some unethical activities such as downloading pirated novels or movies. Therefore, it is urgent to offer ethics courses to these students. This study also indicates that Internet ethics education should be tailored to meet the needs of students at different levels of expertise in computer use.

6 Conclusion

This study conducted a survey to investigate college students' awareness of ethical issues on the Internet and their attitude to these issues. It indicates that gender, age, academic major and expertise in computer use are related to students' different perceptual ethical values. The study provides empirical evidence to explain college students' awareness of and attitude to ethical issues surrounding the use of the Internet and support Internet ethics education in China. However, there are some limitations in this study. First, the sample is limited to the universities in Tianjin. Education in Tianjin is relatively developed compared to the western region of China. The results should be validated in the western or other developing areas in China. Second, the study is mostly a descriptive one and the results are tentative. All the results need to be further examined. Different research methods, such as focus group interviews or field studies, will be adopted in our future studies.

Author contributions

National Science Library,
Chinese Academy of
Sciences

Y.L. Li (yuelinli@nankai.edu.cn, corresponding author) designed the research and wrote the paper; Y. Li (leeying0421@163.com) analyzed the data; A. Li (angela198909@163.com) collected the data.

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