



Investigation and Countermeasures of Network Information Security Literacy of Higher Vocational Students

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Abstract. With the development of Internet information technology and the wide application of big data, the problem of network information security has attracted more and more attention, especially higher vocational students are often deceived. Firstly, this paper designs a questionnaire about Higher Vocational Students' network information security literacy. Through the network questionnaire, 318 questionnaires were collected. The reliability was tested by factor analysis. SPSS is used to analyze the network information security from four aspects: awareness, knowledge, skills and legal knowledge. Finally, this paper puts forward some suggestions to strengthen college students' network information security literacy education, which provides a useful reference for higher vocational colleges to carry out effective network information security literacy education.

Keywords: Social network · Privacy protection · Questionnaire survey · Statistical analysis

1 Introduction

In 2021, China released a statistics on the development of the Internet. This is the 49th time. According to the report, the number of Internet users in China has exceeded 1 billion. More than 40 million Internet users were added compared with last year. There are 158 million Internet users aged 6–19, accounting for 15.7%. From the perspective of career structure, among China's Internet users, the student group is the largest, accounting for 25.4%. College students are the main force of Chinese Internet users and an important participant in the internet group. From the perspective of age structure, Chinese Internet users are young and middle-aged people. The proportion of Internet users aged 30–39 is 20.3%, which is the highest among all age groups. In the past year, 50.8% of Internet users have encountered network security problems. According to the categories of network security incidents encountered by users, personal information leakage accounted for 27.3% of the categories of security incidents encountered by Internet users, an increase of 0.2% over the same period in 2020. Improper safekeeping of personal information can easily lead to property security risks, such as network fraud [2]. Higher Vocational Students often register various network application platforms under the real name system.

However, the protection of user information on many platforms is not in place. These platforms are often attacked by hackers and criminals. Higher Vocational Students' personal information is easily exposed to fraudsters [1]. Higher Vocational Students become the main target of fraudsters. In this era of Internet, it is a must to improve the literacy level of network information security of Higher Vocational education college students. It is of great significance to the development of society.

The network is developing rapidly. The application of big data is becoming more and more extensive. Since then, the society has paid more and more attention to the problem of network information security [3]. Higher Vocational Students are an active group of network users, and their network information security problems are also very prominent, which are mainly reflected in their weak ability to distinguish network information, weak awareness of personal information protection and low knowledge of information security. The lack of information safety literacy is easy to lead to the risk of Higher Vocational Students' personal safety and property safety.

The concept of network information literacy generally refers to people's ability to effectively use and create information in the network environment. It not only includes the skills of information acquisition, expression and communication, but also the attitude and method of independent learning, as well as the responsibility and morality of working, studying and living in the information society. Improving Higher Vocational Students' information security literacy is an urgent matter. This paper puts forward some suggestions on how to cultivate the network information security of Higher Vocational education universities.

2 Related Studies

2.1 Current Research Status at Home and Abroad

Network information literacy is a concept that is difficult to define. In reference 1 [6], the author divides network information literacy into four parts. The first part is the knowledge of network information, the second part is the consciousness of network information, the third part is the ability of network information, and the fourth part is the morality of network information. This paper holds that the content of network information literacy should include network information security literacy. The main reason is that the problems of network information security of network users are not only more and more, but also more and more complex. The first reason is that many network users have problems such as weak awareness of personal information protection and insufficient knowledge of network information security. The second reason is that some enterprises wantonly collect and use user information, which makes personal information face severe risks. Some companies use probe boxes, phishing messages, APP downloads and other means to illegally steal consumers' personal information, and then sell this information to make profits. This paper holds that network information literacy is a part of network information security literacy, which includes network information literacy. For the definition of the content of network information security literacy, reference 4 [4] believes that network information literacy includes information security awareness, information security knowledge, information security ability and information ethics. Some scholars believe

that network information security literacy also includes network information legal literacy. Some scholars believe that network information security literacy also includes network information legal literacy.

This paper holds that Higher Vocational Students' network information security literacy refers to the comprehensive quality of Higher Vocational Students' awareness, knowledge, skills, law and morality of information security in order to maintain information security under the condition of network informatization. The network information security literacy of Higher Vocational education college students consists of four parts. The first part is about the awareness of Internet information security, the second part is about the knowledge of Internet information security, the third part is about the skills of Internet information security, and the fourth part is about the law and morality of Internet information. Network information security awareness refers to the level of awareness of the importance of information security in the use of information, and the sensitivity of users in obtaining information resources security and detecting information security matters. Network information security knowledge means that users should master the basic concepts, principles and methods of information security and understand the latest technology of computer security and network security. The technology and ability of users to prevent and deal with information security problems can be called network information security skills. Network information law and ethics refers to the code of conduct and ethics that users understand the laws and regulations related to network information and generally agree and abide by in information behavior.

3 Methodology

3.1 Survey Scale Design

In May 2022, an online questionnaire survey was conducted within the college. The colleges of science and engineering and liberal arts were randomly selected as the subjects of the questionnaire. Questionnaire distribution channels include QQ and Wechat. 318 questionnaires were collected in this survey. These questionnaires are carefully filled in by students. Therefore, it is all valid. The reliability of the questionnaire was analyzed by SPSS software. Make a network information security Literacy Scale for Higher Vocational Students, and analyze it according to this form.

3.2 Questionnaire Design

The questionnaire of this paper contains two parts. The first part is the information of Higher Vocational education college students, and the second part is the general knowledge of network information security of Higher Vocational education college students. The network information security literacy of Higher Vocational education college students consists of four parts. The first part is about the awareness of network information security, the second part is about the knowledge of network information security, the third part is about the skills of network information security, and the fourth part is about the law and morality of network information. There are 3 questions or 5 questions in the questionnaire. If there are 5 questions, the score is 5 grades. "1" means very disapproval,

“2” means a little disapproval, “3” means unclear, “4” means approval, “5” means very approval. For three questions, the score is three grades, “1” means very disapproval, “2” means yes, “3” means very approval. The scores of all items were positive, and the degree of consistency increased in turn.

4 Results and Analysis

After the survey, the collected questionnaires were simply analyzed by software.

4.1 On the Credibility of the Questionnaire

The factor analysis method is adopted for the analysis, and the results are shown in Table 1. The value of KMO is 0.928, the approximate chi square value is 4243.139, the degree of freedom is 351, and the significance is 0.000. Rom the analysis results, the design structure of the questionnaire is very good.

There are common factors among various variables, which is very suitable for factor analysis. For a good scale, the internal consistency a coefficient of the total scale should be at least 0.800. The reliability analysis of the questionnaire shows that the Cronbach’s alpha value of the overall scale is 0.917 The specific results are shown in Table 2. This shows that the internal consistency of the 40 topics of the network information security literacy scale is good (Fig. 1).

Then, the analysis of variance is carried out, and the results are shown in Table 3. The analysis results show that the overall reliability of the questionnaire is very high (Table 4).

Table 1. Examples of literacy lists

| Variable description | Very familiar | Just understand | Do not understand |
|--|---------------|-----------------|-------------------|
| Do you have selective permission to prohibit APP? | 1 | 2 | 3 |
| Will you use the same password in various information systems? | 1 | 2 | 3 |
| Do you change your password regularly? | 1 | 2 | 3 |
| Do you regularly back up important data? | 1 | 2 | 3 |
| On the Internet, what would you do if someone asked you to fill in real personal information | 1 | 2 | 3 |
| How often do you use antivirus software | 1 | 2 | 3 |
| Do you understand the risk of divulging bank SMS verification code | 1 | 2 | 3 |

Table 2. KMO test and Bartlett’s test

| | | |
|--------------------------|------------------------|----------|
| KMO value | | 0.928 |
| Bartlett sphericity test | Approximate chi square | 4243.139 |
| | df | 351.000 |
| | p | 0.000*** |

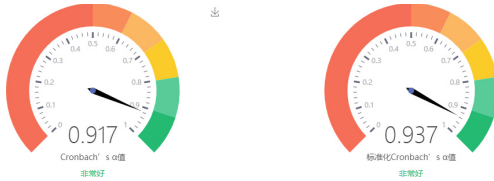


Fig. 1. KMO

Table 3. Reliability statistics

| Cronbach’s α | Number of items | Number of samples |
|---------------------|-----------------|-------------------|
| 0.917 | 19 | 318 |

Table 4. Confirmatory Factor Analysis, CFA

| Mean variance extraction ave value | Combined reliability CR value |
|------------------------------------|-------------------------------|
| 0.482 | 0.936 |

4.2 Questionnaire Analysis

The total number of questionnaire samples of higher vocational students collected this time is 318, from 2 different colleges. According to gender analysis, 192 boys participated in the survey, accounting for 60.38%; There are 126 girls, accounting for 39.62%.

(1) Higher Vocational college students lack of awareness of network information security

Data analysis shows that the average value of this part of the questionnaire is 3.87, and the ideal result value should be 4. The average value of the data is below the ideal value, which shows that higher vocational students lack the awareness of network information security. The results of independent sample t-test analysis show that there are differences in network information security awareness between male and

Table 5. About Analysis of Awareness

| Variable value | sample size | standard deviation | t value | p value | Mean difference | Cohen's d value |
|----------------|-------------|--------------------|---------|---------|-----------------|-----------------|
| girl | 126 | 0.498 | 2.162 | 0.031 | 0.119 | 0.254 |
| boy | 192 | 0.467 | | | | |
| total | 318 | 0.482 | | | | |

Table 6. About Analysis of Knowledge

| Variable value | sample size | standard deviation | t value | p value | Mean difference | Cohen's d value |
|----------------|-------------|--------------------|---------|---------|-----------------|-----------------|
| girl | 126 | 0.558 | 3.258 | 0.001 | 0.220 | 0.374 |
| boy | 192 | 0.610 | | | | |
| total | 318 | 0.598 | | | | |

female college students. The value of boys is higher than that of girls. The difference is small (0.20, 0.50 and 0.80 correspond to small, medium and large critical points respectively) (Table 5).

- (2) Higher vocational students lack of knowledge about network information security Data analysis shows that the average value of this part of the questionnaire is 3.92, and the ideal result value should be 4. The average value of the data is below the ideal value, which shows that higher vocational students are relatively lack of network information security knowledge. The results of independent sample t-test analysis show that there are differences in network information security knowledge between male and female college students. The value of boys is higher than that of girls. The difference is small (0.20, 0.50 and 0.80 correspond to small, medium and large critical points respectively) (Table 6).

- (3) Higher vocational students' skills about network information security are relatively low

Data analysis shows that the average value of this part of the questionnaire is 3.9, and the ideal result value should be 4. The average value of the data is below the ideal value, which shows that higher vocational students lack network information and have low skills. The results of independent sample t-test analysis show that there is no differences in network information security skills between male and female college students. The difference is small (0.20, 0.50 and 0.80 correspond to small, medium and large critical points respectively) (Table 7).

- (4) Higher vocational students lack legal knowledge about network information security

Data analysis shows that the average value of this part of the questionnaire is 3.86, and the ideal result value should be 4. The average value of the data is below the ideal value, which shows that higher vocational students lack legal knowledge of

Table 7. About Analysis of Skills

| Variable value | sample size | standard deviation | t value | p value | Mean difference | Cohen's d value |
|----------------|-------------|--------------------|---------|---------|-----------------|-----------------|
| girl | 126 | 0.561 | 2.017 | 0.045 | 0.143 | 0.231 |
| boy | 192 | 0.649 | | | | |
| total | 318 | 0.619 | | | | |

Table 8. About Analysis of Legal Knowledge

| Variable value | sample size | standard deviation | t value | p value | Mean difference | Cohen's d value |
|----------------|-------------|--------------------|---------|---------|-----------------|-----------------|
| girl | 126 | 0.586 | 0.933 | 0.352 | 0.065 | 0.107 |
| boy | 192 | 0.617 | | | | |
| total | 318 | 0.605 | | | | |

network information. The results of independent sample t-test analysis show that there is no difference in the legal knowledge of network information between male and female college students. The difference is small (0.20, 0.50 and 0.80 correspond to small, medium and large critical points respectively) (Table 8).

To sum up, the analysis shows that the overall situation of Higher Vocational Students' network information security literacy is not ideal and needs to be further improved.

5 Discussion

Strengthening the cultivation of Higher Vocational Students' awareness of network information security. Schools should be the main body of network security education. From the school level, we should attach great importance to network security education, attach great importance to the cultivation of network security awareness, and be ideologically aware of the importance and urgency of network security education. Establish a security training group, formulate the teaching plan of network security education, clarify responsibilities and divide labor carefully. We can carry out network information security awareness education for Higher Vocational Students through lectures, theme class meetings, students' QQ working group and Wechat working group [5]. For example, introduce the risk of bank SMS verification code disclosure to Higher Vocational Students. Because you can transfer the money after receiving the SMS verification code from the bank. This is the last line of defense to protect funds.

Enrich the knowledge of network information security of Higher Vocational Students. Higher vocational schools can offer public elective courses on network information security knowledge. Popularize the basic knowledge, concepts and principles of information protection technology to Higher Vocational Students through the course. Students can understand the hazards of various viruses and Trojans through the course. Let students know how the virus spreads. In this way, students can know how to prevent common network viruses.

Improving the skills of network information security of Higher Vocational Students. Higher vocational colleges should often carry out skill education on network information security for Higher Vocational Students. For example, organize and carry out campus network information security skills competition and other activities every semester [7]. Let Higher Vocational Students master basic network information security protection skills.

Strengthening the study of network information security law for Higher Vocational Students. Higher vocational colleges should carry out legal education and publicity on network information for Higher Vocational Students. Let students learn <<the personal information protection law of the people's Republic of China (order of the President No. 91)>> and <<the data security law of China>>. Students can learn through online quality courses, MOOC and other ways. This can enhance the legal awareness of higher vocational students about Internet information security [8]. So that students can protect their legitimate rights and interests through official complaints or legal channels after their personal information is leaked.

6 Conclusion

Firstly, this paper designs a questionnaire about Higher Vocational Students' network information security literacy. Through the network questionnaire, 318 questionnaires were collected. The collected documents are analyzed. The questionnaire is reasonably designed and has high validity, which can be used for analysis. Through statistical analysis, it is found that the overall level of network information security literacy of higher vocational students is not high. First, higher vocational schools should actively educate and cultivate students' awareness of protecting personal privacy and let students know to protect themselves. By carrying out legal education to safeguard students' personal rights and interests, let students know that their privacy is sacred and inviolable. Dare to resist the infringement of their privacy. When being infringed, higher vocational students should know how to use legal means to protect their legitimate rights and interests. Second, we should strengthen cooperation between schools and families. Enhance parents' awareness of protecting children's privacy. This can promote family education and protect children's rights and interests from the perspective of comprehensive, equal and harmonious development. Third, the state should actively implement various laws and regulations. Form an atmosphere of respecting and protecting the privacy of higher vocational students in China.

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