



# Improving College Students' Information Management Ability

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**Abstract.** This paper studies the current situation of college students' information literacy through the investigation of the website, and constructs a model to improve college students' information literacy. In order to verify the validity of the model, 15 college students are selected for interviews, and it is found in the interview that information ethics also affects college students. Therefore, we put forward a hypothesis with information ethics, and used the method of questionnaire survey to verify again. First, we used SPSS to carry out statistical analysis on the reliability and validity of the questionnaire data, and then we used Amos to verify our hypothesis, and according to these research results, it proposes ways to improve the information literacy of college students.

**Keywords:** Information Literacy · Model validation · Questionnaire

## 1 Introduction

Recently, Chinese rapid development has promoted the development of information technology, and the information age has arrived. The arrival of the information age makes human society is carrying on a historic change, life style, learning style has presented a multidimensional, multi-level development [8] The core content of education and teaching has also changed to setting up the concept of lifelong learning and cultivating innovative talents. Information literacy is not only an important standard to measure individual comprehensive quality but also a reflection of them ability in the information society. In short, the cultivation of social information literacy is related to the survival and development of social members in the new era of socialism. In such a background, countries increasingly attaches great importance to the cultivation of social members of the world's information literacy, and members of the community of information literacy cultivation as one of the main content of education, but also to the cultivation of information literacy to join all kinds of education goals and evaluation system, makes the cultivation of information literacy assessment is an important personal accomplishment comprehensive ability of college students. In 1984, the Ministry of Education put forward the requirement that all colleges and universities should set up literature retrieval courses to cultivate the ability of college students to use libraries to search literature. However, the educational concept of "valuing technology over accomplishment" and the lack of

scientific and systematic cultivation mode deeply affect the cultivation and improvement of information accomplishment of college students in China. In today's society, the information literacy of college students is far from meeting the demand for talents in the development of education. Therefore, there is a big gap between the information literacy of college students in China and those in developed countries.

## 2 Overview of Information Literacy of College Students

Information literacy is a kind of tools. The information literacy of normal university students is the attitude to information activities formed by normal university students to solve problems by using information and information means according to the requirements of social information environment and information development. It should not only include normal university students' understanding of the basic knowledge of information, the mastery of the use of information tools and the learning of information knowledge in the future teaching, but also include the understanding and observance of information ethics. The concept of information literacy was put forward by Paul Zekowski, the simple definition, from the American Library Association in 1989 [9], is to be able to determine when information is needed, how to obtain it, and how to evaluate and effectively use it.

The concept of information literacy education originated from library user education. It refers to a series of social education and training activities to inspire people's information awareness, improve people's information ability, and improve people's information ethics. Pi Jiezheng believes that "information literacy education is an educational activity for the purpose of improving individual information literacy, emphasizing the overall development of human personality." It refers to the use of computer technology, media equipment to collect, the ability to store and process information. It can also be understood as an information education activity that emphasizes the overall. In the information environment, in addition to cultivating people's information awareness and improving people's comprehensive information capabilities other than technical capabilities, it is also necessary to strengthen ethics. Information literacy education has new requirements in the new environment. The content education has expanded from the acquisition and use of information to "data literacy", "scientific literacy" and "innovation literacy".

Current research generally focuses on investigation and case analysis. For example, Zhou Yan took 28 colleges and universities in Shaanxi Province as the research object, and carried out research from five aspects: holding method, opening time, object-oriented, opening form, and included content. Corresponding education system, combined with online and offline information literacy education and other suggestions; Meng Li and Qin Changjiang analyzed the educational form and content of information literacy education in 42 "double first-class" university libraries and found that university libraries the concept of it is generally conservative, and the teaching content is not sufficient, and elements such as element training need to be added. Jin Mei took the Guizhou University for Nationalities library as an example, analyzed this in the school, and put forward to countermeasures such as strengthening content design, developing innovative teaching methods, and strengthening librarian teacher training; Qian Yin and Sun Yi investigate

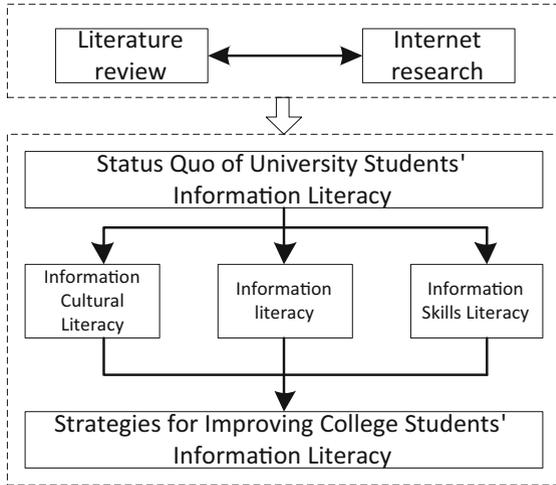


Fig. 1. Strategies for Improving College Students' Information Literacy

the freshmen admission information literacy platform of the Shanghai Jiaotong University Library, and use HTML5 and CSS3 technologies to propose new measures that are conducive to freshmen admission information literacy platform.

College students are regarded as the "main force" in national construction. Increasing higher education, higher education is to the world, the network has become the main direction of college education, as a result, students' information literacy, belong to the state to cultivate high quality talent become the main target of the higher education, comprehensive domestic and foreign literature, which can be roughly divided into three kinds of information literacy, information knowledge, information, culture, information skills. Since it is difficult to separate skills from knowledge in practice, developing skills in practice and cultivating knowledge awareness in information are larger dimensions (Fig. 1).

### 2.1 Information Culture

With the rapid development of network in our lives that we study ways, produced very big change, but also lead to a lot of new problems, such as privacy, intellectual property rights and other rights violations, and even appeared the hacker etc., for these questions about the information, also derived a lot of the specification of the behaviour, this situation forms the ethics between information, whether information power can be used to solve the problem [6] The most important thing is whether we can abide by the standards of information, which reflects a person's level of information culture.

## 2.2 Information Knowledge

Whether a person has information literacy, how much information literacy, the most important thing is whether he has information knowledge [1], that is. As for a practical problem, can he think of using information technology to solve it and judge it? Information knowledge is sensitive to information and can better capture, analyze, judge and absorb it.

## 2.3 Information Skills

To see whether a person has information literacy and how high his information literacy is, first of all, it depends on whether he has information knowledge and how strong his information knowledge is. That is, can he think of using information technology to solve a practical problem? Information knowledge can be more sensitive to information and information problems [5] and is the conscious degree of information capture, analysis, judgment and absorption.

According to the above situation, when colleges and universities set up information technology courses, we should design training programs according to different majors and grades. For example, for students majoring in computer related majors, information technology courses should be offered mainly in high-level operation courses [10]; For literature and history students, the focus should be on basic knowledge. Differentiated training programs should also be designed for students of different grades.

## 3 Experimental Designed

In order to deeply understand the mastery of information retrieval websites for students of different professional grades, we have drawn up an interview outline, as shown in Table 1. Through the investigation, it is found that the students majoring in computer have a stronger ability to search the website, and the students majoring in literature and history have a lower mastery of the website than the students majoring in science and engineering.

15 users were randomly selected for the first round of interviews. The results of the interviews showed that some college students mentioned the term information ethics. They believed that information ethics could affect information literacy just like information awareness, information knowledge, and information skills. To explore the relationship between information ethics and it, the researchers conducted a second round of follow-up with their colleagues. The link to the questionnaire was distributed to 500 students, of whom 450 returned the questionnaires. A total of 26 responses were discarded due to incomplete information, resulting in a final sample consisting of 424 valid responses. Table 2 shows the demographic information of the sample. At the same time, we propose several hypotheses to test this, as follows:

- H1. Information Culture is positively related to Information Literacy Ability.
- H2. Information Knowledge is positively related to Information Literacy Ability.
- H3. Information Skills is positively related to Information Literacy Ability.

**Table 1.** Interview outline designed.

Number	Question
1	Have you been concerned about your information literacy? (Yes, continue, otherwise stop)
2	What information retrieval sites have you used? Please list. (Example: Baidu/360/Sogou)
3	Which of the above information retrieval websites do you use the most? How long has it been used? How often is it used?
4	How do you feel about the functionality of this information retrieval site? What's your experience?
5	Do you feel that the information retrieval function is insufficient in the process of use?
6	Do you feel imprisoned in your thought or choice of information while using it?
7	Do you think you will continue to use this information retrieval site for the next three months? Why?
8	Have you given up using any of the above information retrieval websites?
9	What made you quit using it?

**Table 2.** Demographic information.

Measure	Items	Number	Percentage
Gender	Male	219	51.65
	Female	205	48.35
Age	≤18	35	8.25
	18–22	326	76.89
	23–27	63	14.86
Education	Undergraduate	381	89.86
	Masters	43	10.14
Information Retrieval Frequency (hours per day)	≤1 h	112	26.42
	2–3	294	69.33
	4–5	18	4.25

#### H4. Information Ethics is positively related to Information Literacy Ability.

First, we assessed the reliability of the measurement items by examining the values of Cronbach's and composite reliability (CR). As presented in Table 3, the scores of Cronbach's  $\alpha$  and CR for all the constructs are higher than the criterion values of 0.7 suggested by Fornell and Larcker, indicating that all the constructs have good reliabilities.

**Table 3.** Overview of measurement model.

Construct	Item	Outer loading	CA	CR	AVE
Information Culture	IC 1	0.92	0.944	0.961	0.892
	IC 2	0.965			
	IC 3	0.963			
Information Knowledge	IK 1	0.953	0.939	0.956	0.843
	IK 2	0.93			
	IK 3	0.95			
Information Skills	IS 1	0.932	0.927	0.965	0.902
	IS 2	0.919			
	IS 3	0.951			
Information Ethics	IE 1	0.887	0.937	0.954	0.873
	IE 2	0.92			
	IE 3	0.927			
	IE 4	0.939			
Information Literacy Ability	ILA 1	0.929	0.912	0.945	0.850
	ILA 2	0.936			
	ILA 3	0.901			

CA: Cronbach's Alpha. CR: Composite Reliability. AVE: Average Variance Extracted.

Next, we evaluated convergent validity and discriminant validity. The average variance extracted (AVE) values of each construct is higher than 0.5 and the loading values of all items are above 0.7, suggesting that all the constructs have good convergent validity. As shown in Table 4, all the items loadings on their own constructs were higher than the cross-loadings on other constructs. Table 5 shows the correlations between constructs and square roots of AVEs. We can see that the square root of each construct's AVE is larger than its correlations with other constructs, suggesting sufficient discriminant validity.

In order to better understand the impact of information culture, information knowledge, information skills, and information ethics on college students' information literacy, we study their relationship and their impact on information literacy. Table 6 is a summary of the results.

The survey results show that the information literacy of college students in my country is not optimistic. Although Chinese college students gradually realize the importance of scientific information in today's information society, few people can really understand the meaning of information literacy. The information literacy awareness of Chinese college students is not high. The main purpose of surfing the Internet is to find learning materials, followed by playing games, chatting, paying attention to entertainment and current news. Few students use library electronic documents, and have used the academic documents of the school library. The information literacy of college students is mainly

**Table 4.** Results of factor analysis – cross loading.

	ILA	IK	IE	IC	IS
ILA 1	<b>0.929</b>	0.274	0.249	0.414	0.263
ILA 2	<b>0.936</b>	0.193	0.252	0.394	0.215
ILA 3	<b>0.901</b>	0.195	0.227	0.366	0.201
IK 1	0.236	<b>0.953</b>	0.439	0.514	0.681
IK 2	0.224	<b>0.930</b>	0.454	0.470	0.652
IK 3	0.228	<b>0.950</b>	0.453	0.505	0.682
IE 1	0.254	0.454	<b>0.887</b>	0.288	0.636
IE 2	0.280	0.458	<b>0.920</b>	0.214	0.599
IE 3	0.201	0.393	<b>0.927</b>	0.201	0.526
IE 4	0.223	0.428	<b>0.939</b>	0.200	0.543
IC 1	0.475	0.461	0.255	<b>0.920</b>	0.466
IC 2	0.376	0.518	0.233	<b>0.965</b>	0.516
IC 3	0.371	0.518	0.224	<b>0.963</b>	0.512
IS 1	0.263	0.638	0.623	0.446	<b>0.932</b>
IS 2	0.206	0.694	0.530	0.556	<b>0.919</b>
IS 3	0.224	0.662	0.618	0.470	<b>0.951</b>

**Table 5.** Correlations between constructs and square roots of AVEs.

	ILA	IK	IE	IC	IS
ILA	<b>0.922</b>	0	0	0	0
IK	0.243	<b>0.918</b>	0	0	0
IE	0.264	0.475	<b>0.934</b>	0	0
IC	0.426	0.526	0.249	<b>0.944</b>	0
IS	0.248	0.711	0.632	0.525	<b>0.950</b>

manifested as: lack of information awareness, lack of information theory knowledge, slightly poor information ability, and lack of information ethics awareness. There are very few students with resources. Students invest very little time in non-core courses, and most students care about how to pass exams and complete homework, and do not have more information skills and critical thinking skills.

**Table 6.** Summary of results.

	Estimate	S.E.	C.R.	P	Results
IC → ILA	-0.22	0.05	-4.04	***	Supported
IK → ILA	0.16	0.06	2.60	**	Supported
IS → ILA	-2.44	0.35	-7.03	***	Supported
IE → ILA	1.20	0.09	13.67	***	Supported

## 4 Main Ways to Improve College Students' Information Literacy

### 4.1 Enhancing the Understanding of the Importance

Nowadays, in the information society with the rapid development of science and technology, most college students have the basic knowledge and basic skills of relevant information majors. In major colleges and universities, relevant information literacy education has been carried out, such as special lectures on cultivating college students' thinking ability of innovation and entrepreneurship. Colleges and universities are important bases for scientific research and social and cultural innovation. Colleges and universities should help college students overcome knowledge and technical barriers, accurately acquire, analyze, and process valuable information, and then carry out learning and research activities, so as to build the knowledge required by college students. Structure, in order to improve the information literacy of college students.

### 4.2 Strengthen the Construction

After investigation, we found that the current information literacy education courses of major universities and college students are limited to courses, and there are almost no special courses. Obviously, the education there are deficiencies in education courses in major universities [2]. Secondly, due to economic development, the information literacy level of college students in border ethnic areas is obviously low. In order to improve the information literacy level of border ethnic areas, major universities should strengthen the construction courses and teaching reforms. Schools should arrange different teaching contents and priorities for students of different majors and different grades to form a hierarchical information literacy education content system.

### 4.3 Reasonable Use of the Library

The libraries of all universities have comprehensive literature and information resources, a good information environment and superior information technology, so the library must be the most suitable place to carry out this for college students [3]. Therefore, we

believe that the library should give full play to its own advantages. For example, use the opportunity of freshmen to enter the library to effectively carry out the education of college students' information literacy, and regularly carry out special lectures and training activities on related topics to cultivate information for students and teachers. Awareness and information skills, at the same time, cultivate and improve students' thinking ability, processing and utilization ability and innovative ability.

#### 4.4 Create an Atmosphere and Cultural Environment

In order to improve this of college students, we should create a better campus cultural environment, which is the basic condition for improving the information literacy. Schools should actively enhance the digital construction of libraries, rationally use information literacy websites, WeChat public platforms, and school broadcasting stations, carry out more extensive class for college students, and popularize knowledge and information ethics education for college students. Improving the modernization and informatization level of teaching and management methods is also what major colleges and universities need to work hard to achieve. Only by creating a good environment for the growth of students and the information literacy of college students be improved. Secondly, universities also establish more comprehensive information technology application environment [7], which has solved the situation of excessive information consumption or general lack of information ethics among college students. Strengthen positive education and guidance, and cultivate students' sense of social responsibility and self-discipline.

### 5 Concluding Remarks

In this era of knowledge economy, scientific literacy is inseparable from information literacy. Information literacy can improve scientific literacy. College students are the main driving force for future high-tech development. Their information literacy level will not only affect work and study, but also many high levels. Information literacy is very important for them to actively acquire information and knowledge in the future, improve their own ability level and innovative methods [4]. With regard to the improvement of them, the most important thing is to combine the learning and ability of college students, and to effectively improve, actively develop the development of educational information literacy, so as to become high-quality scientific and technological talents and research talents, and contribute to our country's science and economy. Progress brings a huge boost.

**Acknowledgements.** This work was supported by National College Student Innovation and Entrepreneurship Training Program Project "Investigation on the Influence of Information Cocoon Room Effect on the Information Literacy of University Students in Jilin Province". (202111439012).

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