RESEARCH ON INFLUENCING FACTORS AND STRATEGIES OF UNIVERSITY INFORMATION LITERACY EDUCATION - TAKING UNIVERSITIES OF YUNNAN PROVINCE IN CHINA AS AN EXAMPLE

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With the application of modern information technologies such as big data and artificial intelligence in real life, people's lives have become inseparable from information. Society needs more interdisciplinary talents who "understand both majors and information." Universities are an important position for personnel training, and research on university information literacy education has become a research focus. This study takes universities in Yunnan Province as an example, conducts research through the literature research method, interview method, and questionnaire survey method, takes 984 students from three universities in Yunnan Province as the survey object, and conducts a questionnaire survey on university information literacy education. Organize and analyze, explore the influencing factors of university information literacy education, analyze the problems existing in university information literacy education, and put forward targeted countermeasures and suggestions, hoping to attract the attention of universities in Yunnan Province, China, to university information literacy education.

Keywords: university students; information literacy education; information

Introduction

A new round of scientific and technological revolutions represented by information technology is emerging, and information technology has an increasing impact on human beings. People have entered a period of rapid development in the information society, and information globalization has become a major issue in today's social development.

It not only changes the traditional economic model and way of life but also forms a new social model and way of life characterized by information technology (Ming et al., 2019). Information affects all aspects of people's lives, ranging from exchanges between countries to personal work and life, food, clothing, housing, and transportation.

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The development of information technology has brought more convenience to people's survival and development, and at the same time, it has also improved personal information literacy.

Putting forward new standards and new requirements, only by making full use of information can we better obtain the driving force for development, and only by making full use of and controlling information can we survive and develop better (Yin, 2005).

In this situation, cultivating university students' information literacy is the demand of the times, and it is an inevitable requirement to promote China's information construction and improve the quality of personnel training.

Therefore, the Ministry of Education of China released the "Educational Informatization 2.0 Action" Plan,” which clearly stated the basic goal of "improving the ability of teachers and students to apply information technology to comprehensively improving their information literacy" and pointed out in the "Comprehensive Improvement Action of Information Literacy" that "incorporating students' information literacy into the evaluation of students' comprehensive quality " put forward newer and higher requirements for cultivating high-level information literacy talents.

On February 23, 2019, China issued the "Implementation Plan for Accelerating Educational Modernization (2018-2022)," which mentioned "promoting the deep integration of information technology and education and teaching, and supporting schools to make full use of information technology to develop talent training models and teaching method reform, gradually realize the full coverage of informatization, and promote the use of the Internet and other informatization means to serve the entire process of education and teaching." Based on the above content, we can see that the development of educational information technology has put forward higher requirements for university students, which requires university students to have good information literacy.

Only students with good information literacy can truly implement the promotion and popularization of educational information. Therefore, it is more important to pay attention to the university's information literacy education.

Research purposes

This study takes university students in Yunnan Province of China as the research object, discusses the factors that affect university information literacy education at the school level, family level, and individual level, analyzes existing problems, and explores countermeasures and suggestions for improving university information literacy education. The reform and development of information literacy education in universities in Yunnan Province, China, make some useful references.

Literature review

Information literacy

Ma (1997) defined information literacy as "various information qualities possessed by individual members in an information society."

Chen & Li (2002) pointed out that information literacy is a kind of ability to perform information search, information processing, and information utilization to complete a certain task.
A study on influencing factors in information literacy level

Studies by foreign scholars have found that the information literacy level of university students is affected by various factors such as gender, ability, family, and social environment. Williams & Evans (2008) pointed out that gender, subject, and grade are factors that affect students' learning of information literacy skills.

Zhu et al. (2019) proposed that personal factors and environmental factors are the two most important factors affecting students' information literacy learning. Personal factors include information literacy learning interest, information literacy learning attitude, and self-efficacy. Environmental factors include: first, parents' understanding and use of modern information technology at home; second, teachers' information literacy ability and information literacy teaching ability in school.

Michalak et al. (2017) found that if students lack confidence in their literature information retrieval skills, they will have less confidence and willingness to improve their information literacy skills. Self-confidence is an influencing factor that affects students' information literacy level.

A study on the influence of school factors on information literacy education

Du (2014) found through a survey that teachers' use of multimedia and information resources is a factor that affects information literacy education.

Qin (2015) found that factors such as teachers' ability to use information and teachers' attitudes toward information technology significantly affect information literacy education.

San et al. (2018) proposed a multi-level influencing factor model of information literacy education from the perspective of students, schools, and teachers; Xie & Dong (2007) research results found that the information environment, including hardware and software facilities, will affect information literacy education. It has an impact, and the quality of teachers' information technology is the key factor restricting the improvement of information literacy education.

Xu Lanwen (2006) found through research that information literacy education has a significant relationship with the school's information environment.

A study on the influence of family factors on information literacy education

Claro et al. (2012) found that family socioeconomic status has a significant impact on information literacy education through research. Gan & He (2012) found that the education level of students' parents has a significant impact on information literacy education.

Luo & Wang (2018) researched the influencing factors of information literacy. The results of the research showed that family socioeconomic status, family support, and family information atmosphere are important factors that affect information literacy education.

Siddiq et al. (2017) found that the higher the education level of the father, the higher the information literacy of the students.

Research on the influence of personal factors on information literacy education

Yang et al. (2018) found that factors such as students' place of origin, gender, grade, and self-efficacy have a significant impact on information literacy education.

The research analysis of Aesaert & Braak (2015) found that students' learning attitudes are all factors that affect the differences in information literacy education.
A survey by Siddiq et al. (2017) found that students' self-efficacy has a positive correlation with information literacy.

Liu et al. (2008) surveyed students' information literacy and found that students' learning attitudes have a significant impact on information literacy education.

By summarizing the related research of Chinese and foreign scholars on the influencing factors of information literacy education, it is found that these influencing factors mainly focus on the school level, family level, and student level.

**Research methods**

This research mainly adopts the methods of interviews and questionnaire surveys. First, this study constructs the evaluation index system of university information literacy education and the index system of influencing factors of university information literacy education through interviews. Among them, the evaluation index system of university information literacy education is mainly composed of four dimensions: information awareness, information knowledge, information ability, and information ethics. The index system of influencing factors in university information literacy education is mainly composed of three dimensions: school level, family level, and individual level.

This study follows the basic preparation process of the evaluation questionnaire, compiles the "Information Literacy Education Questionnaire for University Students" for investigation, and conducts a survey in Yunnan, China. Questionnaires were distributed to three universities in the province, and 984 questionnaires were collected.

After the questionnaires were collected, SPSS 22.0 software was used for data entry and inspection, and finally, the survey data for analysis were obtained.

**Formation of the questionnaire**

Through interviews with university library managers, department directors, teachers, and students in Yunnan Province, China, to understand their true views and feelings on university information literacy and its education content, methods, influencing factors, etc., to construct university information literacy education, respectively, an evaluation index system and an index system of influencing factors of university information literacy education. According to the index system, the "Questionnaire on Current Situation of Information Literacy Education of University Students" and "Questionnaire on Influencing Factors of Information Literacy Education of University Students" were compiled. The two questionnaires were combined to form 44 items in the "Questionnaire on Information Literacy Education of University Students." The relevant dimensions of the questionnaire consisted of details as at Fig.1..
After the formation of the evaluation index system for university students' information literacy education, according to the index system and combined with the literature review, the "Questionnaire on the Current Situation of University Students' Information Literacy Education" was compiled. Among them, there are 4 items in the dimension of "information awareness," 4 items in the dimension of "information knowledge," 4 items in the dimension of "information ability," and 4 items in the dimension of "information ethics".

Table 1 - Index system of influencing factors in university information literacy education (made by the author)

<table>
<thead>
<tr>
<th>Main category</th>
<th>Core category</th>
</tr>
</thead>
<tbody>
<tr>
<td>school level</td>
<td>school information environment</td>
</tr>
<tr>
<td></td>
<td>information literacy-related courses</td>
</tr>
<tr>
<td></td>
<td>teacher's Information Literacy Competence</td>
</tr>
<tr>
<td>family level</td>
<td>family support</td>
</tr>
<tr>
<td></td>
<td>family atmosphere</td>
</tr>
<tr>
<td>personal level</td>
<td>self-efficacy</td>
</tr>
<tr>
<td></td>
<td>learning attitude</td>
</tr>
<tr>
<td></td>
<td>learning motivation</td>
</tr>
</tbody>
</table>

After the formation of the index system of influencing factors of university information literacy education, according to the index system and combined with the literature review, the "Questionnaire of Influencing Factors of University Students' Information Literacy" was compiled.

Among them, the "school level" dimension has a total of 12 items, the "family level" dimension has a total of 6 items and the "personal level" dimension has a total of 10 items.

Formation of a test and a formal questionnaire
This part adopts the method of random sampling to test among the undergraduates of Dali University in Yunnan Province, China. According to the interview results, the pre-test data is collected in the form of a questionnaire survey, and the data are statistically analyzed. The statistical analysis software SPSS22.0 is used to conduct item analysis, factor analysis,
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reliability analysis, and validity analysis on the collected data. After analysis, the questionnaire has good content validity and structural validity, and there is no need to adjust the items within each dimension.

**Formal testing**

The official test will be carried out in November 2022. Questionnaires will be placed in three universities in Yunnan Province, China: Yunnan University, Kunming University of Science and Technology, and Dali University, and a total of 984 valid questionnaires will be returned. The distribution of demographic variables in this survey is shown in Tab. 2.

Table 2: Distribution of demographic variables in the questionnaire on influencing factors of university information literacy education

<table>
<thead>
<tr>
<th>Demographic variables</th>
<th>Classification</th>
<th>frequency</th>
<th>percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gender</td>
<td>Male</td>
<td>442</td>
<td>44.9</td>
</tr>
<tr>
<td></td>
<td>Female</td>
<td>542</td>
<td>55.1</td>
</tr>
<tr>
<td>Nationality</td>
<td>Han nationality</td>
<td>661</td>
<td>67.2</td>
</tr>
<tr>
<td></td>
<td>minority</td>
<td>323</td>
<td>32.8</td>
</tr>
<tr>
<td>Place Of Student Come From</td>
<td>City</td>
<td>622</td>
<td>63.2</td>
</tr>
<tr>
<td></td>
<td>the countryside</td>
<td>362</td>
<td>36.8</td>
</tr>
<tr>
<td>Grade</td>
<td>Freshman</td>
<td>454</td>
<td>46.1</td>
</tr>
<tr>
<td></td>
<td>sophomore</td>
<td>294</td>
<td>29.9</td>
</tr>
<tr>
<td></td>
<td>Junior</td>
<td>148</td>
<td>15.0</td>
</tr>
<tr>
<td></td>
<td>Senior</td>
<td>88</td>
<td>8.9</td>
</tr>
<tr>
<td>Professional Type</td>
<td>Literature and History</td>
<td>226</td>
<td>23.0</td>
</tr>
<tr>
<td></td>
<td>Science and Engineering</td>
<td>344</td>
<td>35.0</td>
</tr>
<tr>
<td></td>
<td>Medicine</td>
<td>269</td>
<td>27.3</td>
</tr>
<tr>
<td></td>
<td>Arts, Sports, and Others</td>
<td>145</td>
<td>14.7</td>
</tr>
<tr>
<td>Total</td>
<td></td>
<td></td>
<td>100</td>
</tr>
</tbody>
</table>

**Research result**

According to the research theory and interview results of this study, the main influencing factors that affect university information literacy education include three aspects: school level, family level, and individual level.

Therefore, multiple linear regression analyses were used to analyze the relevant influencing factors.

From the analysis summary in the table above, we can see that factors at the school level, family level, and individual level all have a significant positive impact on university information literacy education, among which the school level has the greatest impact, followed by the family level and individual level.

From the analysis summary in the above table, factors at the school level, family level, and individual level have a significant positive impact on students’ information awareness, information knowledge, information ability, and information ethics.

The results show that the school level has a significant positive impact on students’ information awareness. Awareness, information knowledge, information ability, and information ethics have the greatest impact, followed by family level and individual level.
### Table 3 - Multiple linear regression analysis of school level, family level, and individual level on university information literacy education

(made by the author)

<table>
<thead>
<tr>
<th>variable</th>
<th>unnormalized coefficient β</th>
<th>standard error</th>
<th>standardized coefficient β</th>
<th>t</th>
<th>P</th>
<th>β 95% confidence interval for</th>
</tr>
</thead>
<tbody>
<tr>
<td>constant</td>
<td>-0.610</td>
<td>0.069</td>
<td>-8.838</td>
<td>0.001</td>
<td>-0.745</td>
<td>-0.474</td>
</tr>
<tr>
<td>school level</td>
<td>0.474</td>
<td>0.023</td>
<td>0.388</td>
<td>20.290</td>
<td>0.001</td>
<td>0.428</td>
</tr>
<tr>
<td>family level</td>
<td>0.350</td>
<td>0.020</td>
<td>0.347</td>
<td>17.397</td>
<td>0.001</td>
<td>0.311</td>
</tr>
<tr>
<td>personal level</td>
<td>0.339</td>
<td>0.026</td>
<td>0.292</td>
<td>12.849</td>
<td>0.001</td>
<td>0.287</td>
</tr>
</tbody>
</table>

R=0.909, Adjusted R²=0.826, F=1557.341, P<0.05

### Table 4 - Summary table of multiple linear regression analysis of university information awareness, information knowledge, information ability, and information ethics at the school level, family level, and individual level

(made by the author)

<table>
<thead>
<tr>
<th>variable</th>
<th>constant</th>
<th>school level</th>
<th>family level</th>
<th>personal level</th>
<th>constant</th>
<th>school level</th>
<th>family level</th>
<th>personal level</th>
<th>constant</th>
<th>school level</th>
<th>family level</th>
<th>personal level</th>
</tr>
</thead>
<tbody>
<tr>
<td>information awareness</td>
<td>-0.610</td>
<td>0.069</td>
<td>-8.838</td>
<td>0.001</td>
<td>-0.745</td>
<td>-0.474</td>
<td>0.474</td>
<td>0.023</td>
<td>0.388</td>
<td>20.290</td>
<td>0.001</td>
<td>0.428</td>
</tr>
<tr>
<td>information knowledge</td>
<td>-1.303</td>
<td>0.121</td>
<td>-10.764</td>
<td>0.001</td>
<td>-1.540</td>
<td>-1.065</td>
<td>0.733</td>
<td>0.041</td>
<td>0.476</td>
<td>17.876</td>
<td>0.001</td>
<td>0.652</td>
</tr>
<tr>
<td>information capability</td>
<td>-0.770</td>
<td>0.120</td>
<td>-6.438</td>
<td>0.001</td>
<td>-1.005</td>
<td>-0.536</td>
<td>0.899</td>
<td>0.041</td>
<td>0.633</td>
<td>22.187</td>
<td>0.001</td>
<td>0.820</td>
</tr>
<tr>
<td>information ethics</td>
<td>-1.467</td>
<td>0.130</td>
<td>-11.309</td>
<td>0.001</td>
<td>-1.722</td>
<td>-1.213</td>
<td>0.727</td>
<td>0.044</td>
<td>0.455</td>
<td>16.548</td>
<td>0.001</td>
<td>0.641</td>
</tr>
<tr>
<td></td>
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<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

R=0.826, Adjusted R²=0.662, F=643.798, P<0.05

**Discussion**

Through the questionnaire analysis, it was found that the factors at the school level are the most important factors affecting the information literacy of university students in Yunnan Province, China.
Therefore, to further find out the information literacy education problems at the school level, this study randomly selected 3 universities in Yunnan Province, China. Select 20 students to conduct interviews to find out the existing problems more deeply. The main problems are summarized as follows:

The information technology environment at universities is not good. The specific manifestations are as follows:

First, the construction of network information still needs to be strengthened. The computers in the computer room of the school are outdated, the network speed is slow, and the user experience is poor.

Second, the school’s wireless network coverage is not wide, or even the whole school is not covered, which not only affects the speed of students’ search for literature information but also affects students’ learning of information knowledge and ultimately affects the improvement of students’ information literacy teaching level.

The information literacy curriculum is unreasonable. The specific performance is that the information literacy course is only offered as an elective course for general education, not a compulsory course that every student must learn, and the class hours will be adjusted according to the situation of each school. Full coverage, not very good course start guarantee.

Information literacy education is disconnected from student needs. Specifically, in the process of searching for literature information, students are accustomed to using network search engines to find literature information and seldom use school library database resources to find literature information. The reason is that using network engines to search for literature information does not require the corresponding retrieval knowledge, which can be self-taught without professional training.

However, using the database of the school library to retrieve literature information requires professional training to master certain retrieval skills, which reflects the problem that information literacy education in universities is out of touch with the needs of students, which restricts the improvement of university students' information literacy.

Information literacy course materials are unreasonable. The specific manifestations are: although the textbooks selected by the school have a certain degree of universality, most of the contents of the textbooks are biased towards the explanation of theoretical knowledge, sorting out some retrieval knowledge, and less explanation of practical teaching, ignoring the content of information literacy courses. In addition, the content of these textbooks is not only difficult to understand, but it is also difficult for teachers to combine the content of the textbooks with the actual situation of the school to carry out teaching, which cannot promote the improvement of students' information literacy.

**Summary and recommendations**

Based on the questionnaire survey, this paper believes that factors at the school level are the most important factors affecting the information literacy of university students. Therefore, through student interviews, it was further found that there are many problems at the school level that affect the information literacy of university students and their education. The following countermeasures are suggested.

Improve and enhance the information environment at universities. One is to increase the construction of network infrastructure, increase funding, increase the broadband bandwidth of the campus network, and achieve full coverage of wireless networks.
The second is to use modern information technology to improve the construction of knowledge-sharing and information-sharing platforms, reduce students' energy expenditure on studies, actively provide students with convenient learning conditions and environments, so that students can receive better information literacy education, and ultimately achieve the purpose of improving students' information literacy level.

Reasonably set up information literacy education courses. The first is to adjust the curriculum and make the information literacy courses from elective courses to compulsory courses so that every student could learn relevant information literacy courses at the university level. The second is to follow the teaching rules according to the actual needs of the students. Based on ensuring the hours of theoretical courses, add practical courses on the computer, combine learning with practice, and ensure that students can not only learn certain retrieval knowledge but also apply this theoretical knowledge. Exercise to practice, to achieve the purpose of combining learning with practice.

Carry out information literacy education at different levels. Universities should carry out information literacy education at different levels according to the information literacy needs of students in different grades and the actual situation of the school. The first level is to carry out information literacy education for freshmen. The purpose is to popularize the "introductory course" for cultivating information literacy for those freshmen who do not know the library of the school through basic education. The second level mainly focuses on general knowledge education to provide information literacy education for sophomore students. Through literature retrieval and utilization courses, students can acquire basic retrieval knowledge and master basic retrieval skills. Through theoretical study, students can actively acquire information. Acquire awareness and retrieval ability of literature information, master the use of retrieval tools, and develop the ability to analyze and process literature information. The third level is to conduct information literacy education for junior and senior students in the form of information literacy education and general education compulsory courses and carry out information literacy education through a combination of theoretical lectures and practice.

Write appropriate course material.

First, universities can compile course materials that are in line with the environmental conditions and resource facilities of the school library according to the actual situation of the school library, which will be more conducive to the learning of students' information literacy courses and ensure the learning effect.

The second is to broaden the breadth of information literacy education by setting targeted teaching content. The selection of teaching content should be targeted at students of different majors. For those students who need to learn manual retrieval knowledge, manual retrieval should be appropriately increased. Professional knowledge: for other students who do not need to learn manual retrieval knowledge, you can explain the content in general and do not need to explain it as the key content.

In terms of practice, this research, through the investigation and research on the information literacy of university students in Yunnan Province, China, understands the influencing factors of university information literacy education in Yunnan Province, China, explores the existing problems at the school level, and puts forward countermeasures and suggestions.
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To a certain extent, it can provide a reference for the reform and development of information literacy education in universities in Yunnan Province, China.

However, this study also has shortcomings. First, the research object is only for university students in Yunnan Province, China. Whether it is representative or not requires further consideration. Secondly, the coverage of the selected samples is not wide enough, so it needs to be focused on in the follow-up research.

References


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