



Development of educational information literacy of vocational students at Guangxi Vocational University of agriculture in China

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ABSTRACT

In the global information age, information literacy, as the basic literacy to promote people's independent learning, problem solving, and knowledge innovation, has been extensively explored and deeply studied in various countries. This paper studies the educational information literacy level of vocational college students in Guangxi Vocational University of Agriculture. The objectives of this study were 1) to investigate the problems and needs of educational information literacy of vocational college students and 2) to develop a management guideline for improving the educational information literacy of vocational college students. The samples were 392 vocational college students obtained from Guangxi Vocational University of Agriculture through the simple random sampling method. The research instrument used in this study was a questionnaire. The collected information and data were analyzed by the content analysis method and expressed as percentage, mean, and standard deviation. The results show that 1) the problems and needs of educational information literacy of college students in Guangxi Vocational University of Agriculture were at a high level, and 2) the management guideline for improving educational information literacy of vocational college students consisted of 10 chapters. All 10 chapters were evaluated by 3 experts, and the IOC values ranged from 0.67 to 1.00, indicating that the guidelines for the management of vocational college students' information literacy are acceptable and can guide the improvement of students' educational information literacy levels.

Origin and significance of the issue

Nowadays, with the rapid development of information technology, educational information literacy has become one of the important abilities necessary for vocational college students. Students' learning, life, and future career development in the information environment are closely related to the ability to acquire, process, and apply information. Students' educational information literacy can reflect whether the school's talent training method can better adapt to the development requirements of the information society. Improving vocational college students' educational information literacy is conducive to enhancing students' future employment competitiveness and realizing their own career development. In the Internet era, higher vocational college students' information ability is increasingly required. Students should have the ability to

effectively collect, obtain, search, and consult information in massive information resources to support the information teaching mode and adapt to the information work and life. In the development strategy of an innovative country, as an educational practice that meets the needs of the information age, information literacy education has been paid more and more attention by the country (Zhou, Wang, & Lu, 2021). As an important part of comprehensive literacy, information literacy plays a great role in promoting the formation and development of talents' comprehensive literacy (Cai, 2021). However, many schools do not pay enough attention to the cultivation of educational information literacy in the process of education, resulting in obvious deficiencies in information screening, analysis, and application. The research on vocational college students' educational information literacy can not only help identify the shortcomings in the current education system but also provide theoretical support and practical guidance for the development of relevant courses and the improvement of teaching methods. By improving students' educational information literacy, students can enhance their autonomy and enthusiasm in learning and promote students' effective coping with challenges in complex information environments. Therefore, the research on vocational college students' educational information literacy has important academic value and practical significance.

As one of the important links of vocational education, information literacy education can effectively cultivate students' ability to comprehensively use information retrieval knowledge and technology to solve specific problems. Through the investigation of the students in Guangxi Vocational University of Agriculture, the basic situation, existing problems, and needs of the students are analyzed. Through the analysis of the survey results, the author puts forward some suggestions to solve the problem, which provides certain reference significance for training and improving the students' educational information literacy.

Objective

1. To investigate the problems and needs of educational information literacy of vocational college students.
2. To develop a management guideline for improving the educational information literacy of vocational college students.

Literature review

The comprehensive review of existing research literature reveals a multifaceted understanding of educational information literacy among Chinese vocational college students, with scholars approaching this critical topic from various theoretical and practical perspectives.

Research on information literacy development and educational support

Luo's (2021) seminal work, "Research on College Students' Information Literacy and Its Educational Support," establishes a foundational understanding that information literacy serves as a critical competency for contemporary college students navigating an increasingly complex information society. The research emphasizes that information literacy is not merely a technical skill but a comprehensive capability that enables students to address multifarious challenges in both academic and professional contexts.

The study's significance lies in its ecological approach, which recognizes that effective information literacy education cannot be developed in isolation. Rather, it requires a holistic support system that accounts for three crucial dimensions: individual trait differences (recognizing that students possess varying learning styles, cognitive abilities, and prior knowledge), environmental background factors (including institutional resources, technological infrastructure, and socio-cultural contexts), and diversity of information systems (acknowledging the multiplicity of platforms, tools, and resources students must navigate). This ecological perspective suggests that educational interventions must be adaptive and

responsive to the unique circumstances of each learning environment and student population.

Information ecology perspective on literacy training

Ni and Wu's (2024) research, "Information literacy training strategies of vocational college students from the perspective of information ecology," advances the discourse by introducing a systematic framework centered on three core competencies. The authors argue that vocational students must cultivate information awareness-the ability to recognize when information is needed and understand its value in problem-solving contexts. This foundational awareness must be complemented by information skills-the technical proficiencies required to locate, evaluate, organize, and utilize information effectively across diverse digital platforms.

Critically, the research emphasizes information ethics as an indispensable component of information literacy. In an era characterized by information abundance, misinformation, and privacy concerns, ethical considerations regarding information use, citation practices, intellectual property rights, and digital citizenship become paramount. The study's contribution lies in its advocacy for experiential learning methodologies, suggesting that students develop these competencies most effectively through practical engagement with authentic information scenarios. The strategic selection of appropriate information tools and the creation of realistic application contexts facilitate meaningful learning experiences that translate theoretical knowledge into practical capabilities.

Conceptual framework

In this study, the sources of variables mainly include the empirical investigation of vocational college students' educational information literacy and the theoretical basis of educational information literacy management guidelines. These variables help to understand students' needs in educational information literacy and provide data support for improving relevant curriculum and management. A case study of this research was Guangxi Vocational University of Agriculture.

The conceptual framework is as follows:

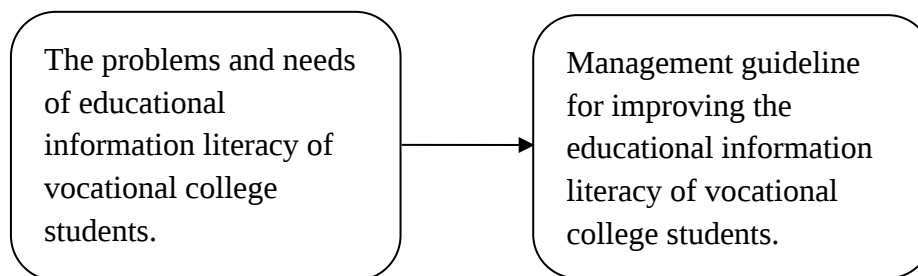


Figure 1 Conceptual framework

Methods

This section provides a detailed description of the research design, population and sample, research instruments, data collection procedures, and data analysis methods employed in this study.

Population and Sample

1. Population

This research utilizes Guangxi Vocational University of Agriculture as a case study. The target population consists of 20,000 students who participated in the information literacy survey at the institution.

2. Sample Group

The sample for this research comprises 392 students who participated in the information literacy survey. The sample size was determined using the Taro Yamane formula (Yamane, 1973), and respondents

were selected through a simple random sampling technique to ensure representativeness and minimize selection bias.

Research Instruments

1. Questionnaires

The primary research instrument is a structured questionnaire designed to gather comprehensive data across three dimensions:

1.1 General information of students – demographic and background characteristics

1.2 Problems of educational information literacy – challenges and difficulties experienced by vocational college students

1.3 Needs of educational information literacy – requirements and expectations regarding information literacy development

Validity Assessment: The questionnaire was evaluated for correctness and suitability by three specialists using the Index of Item-Objective Congruence (IOC) methodology. Each question in the questionnaire achieved an IOC score ranging from 0.67 to 1.00, meeting the acceptable threshold for research validity.

Reliability Assessment: The reliability of the questionnaire was assessed using Cronbach's alpha coefficient, which yielded a value of 0.95, indicating excellent internal consistency and reliability.

2. Focus Group Discussion

A focus group discussion was conducted to develop and validate the management guidelines. Three specialists were invited to participate in the focus group meeting to evaluate the proposed guidelines. The validation results were presented using the Index of Congruence (IOC), with all items achieving an IOC rating of 1.00, indicating complete agreement among experts regarding the appropriateness and relevance of the guidelines.

Data Collection

The data collection process for investigating problems and needs was conducted systematically. The researchers personally collected data and information from the sample group through an online platform via email. All participants were fully informed about the purpose and objectives of the data collection prior to their participation.

With official permission from Guangxi Vocational University of Agriculture, the researchers distributed a total of 392 questionnaires using the Questionnaire Star survey tool platform within the university. All 392 questionnaires were successfully recovered, achieving a 100% response rate, which significantly enhances the validity and representativeness of the research findings.

Data Analysis and Statistics

The collected data and information were systematically analyzed, interpreted, and presented using the following statistical measures:

- Frequency distribution – to show the occurrence of responses
- Percentage – to indicate the proportion of responses
- Mean ($\bar{x}$) – to determine the average level of responses
- Standard Deviation (S.D.) – to measure the variability of responses

A **five-point Likert rating scale** was employed to evaluate both the problems and needs of educational information literacy among vocational college students. This scale enables quantitative measurement of attitudes, perceptions, and experiences, facilitating meaningful statistical analysis and interpretation of the data.

The statistical analysis was conducted to identify patterns, trends, and significant findings that inform the development of appropriate management guidelines for enhancing educational information literacy among vocational college students.

Results

- 1.
2. The problems and needs of educational information literacy in vocational college students.

Table 1 Problems of educational information literacy in vocational college students.

Questions	n=392		Level of problems
	$\bar{X}$	S.D.	
1. I can effectively use the Internet to search for the information I need.	4.13	0.89	High
2. I can judge the reliability and authenticity of information.	3.93	0.86	High
3. I have clear criteria for assessing where information comes from.	3.91	0.87	High
4. I can use a variety of tools (such as databases, search engines) for information retrieval.	4.05	0.85	High
5. I am familiar with the use of online teaching platforms.	3.91	0.87	High
6. I can accurately cite and refer to the research results of others.	3.76	0.91	High
7. I have difficulty in sorting and organizing information.	3.24	1.04	Moderate
8. I don't feel confident using digital tools.	3.13	1.01	Moderate
9. I am able to effectively evaluate and compare information from different sources.	3.64	0.82	High
10. I have trouble finding professional literature.	3.34	0.88	Moderate
11. My knowledge of information security and privacy protection is insufficient.	2.87	1.08	Moderate
12. I didn't get enough information literacy training in the classroom.	3.22	0.93	Moderate
13. I was able to use social media for effective information dissemination.	3.70	0.78	High
14. I am willing to participate in relevant activities and training to improve information literacy.	3.66	0.79	High
15. I often encounter obstacles when using information technology tools.	3.13	0.89	Moderate
Total	3.57	0.90	High

According to table 1, as you can see in the table, the total score is ($\bar{X} = 3.57$, S.D. = 0.90), which was at a high level. Students have a strong ability to use the Internet for information retrieval ($\bar{X} = 4.13$, S.D. = 0.89) and can use a variety of tools (such as databases and search engines) for information retrieval ($\bar{X} = 4.05$, S.D. = 0.85). This shows that most students have some ability in information acquisition. Although students were able to judge the reliability and authenticity of information ($\bar{X} = 3.93$, S.D. = 0.86) and had clear criteria for evaluating sources of information ($\bar{X} = 3.91$, S.D. = 0.87), familiar with the use of network teaching platform ($\bar{X} = 3.91$, S.D. = 0.87).

Students' knowledge level of information security and privacy protection is low ($\bar{X} = 2.87$, S.D. =1.08), which reflects that in the current information society, students' cognition in this important field is still insufficient, and it is urgent to strengthen relevant education. Students lack confidence and find it difficult to use digital tools ($\bar{X} = 3.13$, S.D. =1.01) and ($\bar{X} = 3.13$, S.D. =0.89), which may affect their overall performance in information literacy, especially in information processing and application. Students generally feel that there is a lack of adequate information literacy training in the classroom ($\bar{X} = 3.22$, S.D. =0.93), which means that educational institutions need to strengthen the cultivation of information literacy in curriculum and teaching content. Students have significant difficulties in organizing and organizing information ($\bar{X} = 3.24$, S.D. =1.04), which is a potential obstacle to their learning and research activities.

Table 2 Needs of educational information literacy in vocational college students.

Questions	n=392		Level of needs
	$\bar{X}$	S.D.	
1. I wish there were more training in information retrieval skills.	3.73	0.77	High
2. I need to know how to effectively assess the reliability of information.	3.75	0.77	High
3. I hope schools can offer courses on information security.	3.70	0.78	High
4. I hope to learn how to conduct research using various online databases.	3.76	0.76	High
5. I need more in-depth training to improve my data analysis skills.	3.72	0.77	High
6. I want to know how to manage and organize information effectively.	3.75	0.76	High
7. I think there should be more learning about how to cite and reference literature.	3.75	0.76	High
8. I hope to attend the workshop to improve my digital tools.	3.74	0.77	High
9. I need more practical opportunities to improve my information literacy.	3.78	0.78	High
10. I wish schools could offer courses on the spread of information on social media.	3.75	0.77	High
11. I think we need to create a resource center where students can access information literacy related materials.	3.77	0.79	High
12. I need to learn how to effectively share and communicate information in a team.	3.81	0.74	High
13. I would like to have one-on-one information literacy tutoring.	3.63	0.80	High
14. I want to learn how to use data visualization tools.	3.79	0.76	High
15. I would like to be able to obtain a certificate or recognition to prove my level of information literacy.	3.85	0.82	High
Total	3.75	0.77	High

According to table 2, as you can see in the table, the total score was ($\bar{X} = 3.75$, S.D. = 0.77), which was at a high level. Students hope to obtain certificates or recognition that prove their information literacy level ($\bar{X} = 3.85$, S.D. = 0.82)), which indicates that they have a strong desire for the recognition and improvement of their own abilities, and hope to demonstrate their learning results through certificates. Students need to learn how to effectively share and communicate information in a team ($\bar{X} = 3.81$, S.D. = 0.74), which shows that they value teamwork and information exchange skills and expect to improve their performance in group projects. Students want to learn how to use data visualization tools ($\bar{X} = 3.79$, S.D. = 0.76), which shows that they recognize the importance of data presentation and want to acquire relevant skills to better analyze and communicate information. Students need more practical opportunities to improve information literacy ($\bar{X} = 3.78$, S.D. = 0.78), indicating that practical opportunities are important for students. Students believe that a resource center should be established to access information literacy related materials ($\bar{X} = 3.77$, S.D. = 0.79), indicating a need for access to learning resources and a desire for easier access to information literacy.

Students are eager to receive personalized information literacy tutoring ($\bar{X} = 3.63$, S.D. = 0.80). This demand may stem from students' desire for more instruction in information acquisition and processing to improve their learning efficiency and ability. The high demand of students for information security courses may reflect their concern about information security issues and their desire for related knowledge ($\bar{X} = 3.70$, S.D. = 0.78). In today's digital age, information security awareness is increasingly important, and students expect the school to provide systematic courses to help them improve this ability. The demand for data analysis skills is also high ($\bar{X} = 3.72$, S.D. = 0.77), indicating that students want to enhance their analytical skills through in-depth training. With the rise of big data and data-driven decision making, having good data analysis skills has become an important foundation for career development.

3. The management guideline of educational information literacy training for vocational college students.

Through the survey results, we can provide some suggestions and strategies for the development of management guidelines to improve educational information literacy for vocational college students at Guangxi Vocational University of Agriculture. The management guideline of vocational students' education information literacy training includes 10 chapters.

chapter 1

- Title: Strengthen Training in Information Screening and Collation
- Purpose: Improve students' ability to identify, evaluate, and organize information efficiently.
- Implementation strategy: Organize learning training courses and conduct practical exercises in real scenarios.
- Expected Impact: Solve the problem that the score is at a medium level in the process of information classification and organization (Table 1: $\bar{X} = 3.24$) and high demand for "managing information" (Table 2: $\bar{X} = 3.75$). Enhances critical thinking and learning efficiency.

chapter 2

- Title: Improve Training in Digital Tools
- Purpose: Equip students with proficiency in modern digital tools.
- Implementation strategy: Carry out practical operations using tools such as data management software.

- Expected Impact: Counters low confidence in digital tools (Table 1: $\bar{X} = 3.13$) and aligns with high need for "digital tool workshops" (Table 2: $\bar{X} = 3.74$).

chapter 3

- Title: Strengthen Information Security Education
- Purpose: Raise awareness of network security, privacy protection, and legal compliance.
- Implementation strategy: Develop learning modules on data privacy, phishing, security vulnerabilities, etc.
- Expected Impact: Targets the lowest score in "information security knowledge" (Table 1: $\bar{X} = 2.87$) and meets demand for "information security courses" (Table 2: $\bar{X} = 3.70$).

chapter 4

- Title: Increase Information Literacy Courses
- Purpose: Provide systematic training in information acquisition, evaluation, and application.
- Implementation strategy: The course adopts a hybrid teaching mode of online and offline, and incorporates elective topics on cutting-edge technologies such as artificial intelligence.
- Expected Impact: Supports high need for "practical opportunities" (Table 2: $\bar{X} = 3.78$) and bridges gaps in "information evaluation" (Table 1: $\bar{X} = 3.64$).

chapter 5

- Title: Encourage Cooperation and Exchange
- Purpose: Foster teamwork and knowledge sharing.
- Implementation strategy: Group projects requiring collaborative research and presentations.
- Expected Impact: Addresses high demand for "team communication skills" (Table 2: $\bar{X} = 3.81$) and complements strengths in "social media use" (Table 1: $\bar{X} = 3.70$).

chapter 6

- Title: Establish One-to-One Tutoring
- Purpose: Offer personalized support for diverse learning needs.
- Implementation strategy: Pair students with tutors based on skill gaps.
- Expected Impact: Meets demand for "personalized tutoring" (Table 2: $\bar{X} = 3.63$) and mitigates challenges in "citing sources" (Table 1: $\bar{X} = 3.76$).

chapter 7

- Title: Launch Certification Programs
- Purpose: Validate skills and motivate learning.
- Implementation strategy: Tiered certifications (Basic $\rightarrow$ Advanced) with practical exams.
- Expected Impact: Directly responds to the top need for "certificates" (Table 2: $\bar{X} = 3.85$) and boosts career competitiveness.

chapter 8

- Title: Use Online Learning Platforms
- Purpose: Enable flexible, self-paced learning.
- Implementation strategy: Platforms that offer selected resources such as MOOC.
- Expected Impact: This plan is consistent with the high score performance of "Online Platform proficiency" (Table 1: $\bar{X} = 3.91$).

chapter 9

- Title: Strengthen Teacher Training
- Purpose: Ensure high-quality instruction.
- Implementation strategy: Provide training for teachers on new technologies and teaching methods.

- Expected Impact: Addresses gaps in "classroom training" (Table 1: $\bar{X} = 3.22$) and elevates teaching standards.

chapter 10

- Title: Establish Evaluation Mechanisms
- Purpose: Monitor progress and tailor interventions.
- Implementation strategy: Establish evaluation index standards for assessment.
- Expected Impact: Provides data to refine programs, addressing variability in "information literacy levels" (Table 1: $SD = 0.90$).

These management policies can not only effectively improve the information literacy levels of vocational college students but also have a profound impact on their personal development and career competitiveness. By formulating guidelines for managing the information literacy of vocational college students, vocational colleges can train professionals with higher levels of information literacy and help them better adapt to the rapidly developing information society.

Discussion

1. Discussion of the problems existing in educational information literacy for vocational college students.

According to the results of this study, it can be concluded that the problem of educational information literacy of vocational college students in Guangxi Vocational University of Agricultural is at a higher level ($\bar{X}=3.57$, $S.D.=0.90$). The results of the survey show that many students have some difficulties in using the Internet effectively, judging the reliability of information, and using digital tools for information retrieval. At the same time, students generally believe that their information literacy level needs to be improved, and hope that the school can provide more relevant courses and practical opportunities to enhance their information literacy ability.

Liu (2024) emphasized that most students in vocational colleges lack effective information collection methods, the accuracy of information acquisition is not high, and the awareness and ability to classify, summarize and analyze the obtained information are not strong. Most vocational students have poor information technology practice ability, non-standard retrieval methods or ways, and low accuracy in acquiring knowledge. Some students in higher vocational colleges have weak awareness of information security. Teachers' ability of information literacy is very different, and teachers' teaching ability and practical operation ability are different, which affects part of the teaching effect.

Through the above research and discussion and the survey results of this paper, the more prominent problems in the information literacy of vocational college students are as follows: First, students lack the ability of information screening, and students lack the effective filtering and organizing ability when facing a large amount of information. Second, the use of digital tools is not skilled, reflecting the students' grasp of modern information technology is not high. Especially in the use of online teaching platforms and data analysis tools, students show obvious deficiencies. Third, the awareness of information security is weak. With the complexity of the network environment, students' knowledge of information security and privacy protection is obviously insufficient, which may make them face greater risks in the network environment.

2. Discussion of the needs existing in educational information literacy for vocational college students.

According to the results of this study, students have a higher level of multiple demands for information literacy, indicating that students have a strong demand for the improvement of information literacy. Among them, "I would like to obtain a certificate or recognition to prove my level of information literacy" has the highest average value ($\bar{X}= 3.85$, $S.D. = 0.82$), indicating students' recognition and expectation of information literacy. Schools should consider designing relevant courses and training

according to these needs to enhance students' information literacy abilities.

Liu (2022) pointed out Vocational college students it is necessary to choose the most suitable retrieval strategy, retrieval tools and various information sources to meet the specific information needs. Group learning is needed to develop students' sense of participation and collaboration. Improve students' understanding of the current information environment through practice. It is necessary to enrich the teaching content of students' information literacy, to develop information literacy teaching content that can better meet students' information needs and adapt to the information environment and promote students' information literacy ability and lifelong learning ability. Li (2023, pp. 101-104) believes that in the course of teaching related courses to students, teachers should introduce more online information retrieval resources for students.

Through the above research and discussion and the survey results of this paper, the needs of students in information literacy are summarized as follows: First, students have higher requirements for information retrieval skills and information evaluation and need to open relevant courses. Second, students hope that schools can offer more courses on information security. Thirdly, students generally believe that more practical opportunities are needed to improve information literacy. Fourth, students expect one-to-one professional guidance needs. Information literacy plays an important role in modern education and is an important guarantee for students to adapt to the information society and improve their comprehensive quality.

Originality and body of knowledge

This study makes an in-depth analysis of the information literacy of vocational college students. Through the combination of quantitative and qualitative methods, we can reveal the factors affecting the information literacy of students in a more comprehensive way and put forward targeted improvement strategies. The following is a knowledge system framework for the research on information literacy of vocational college students, covering all dimensions of information literacy and its related factors. It is shown in Figure 2.

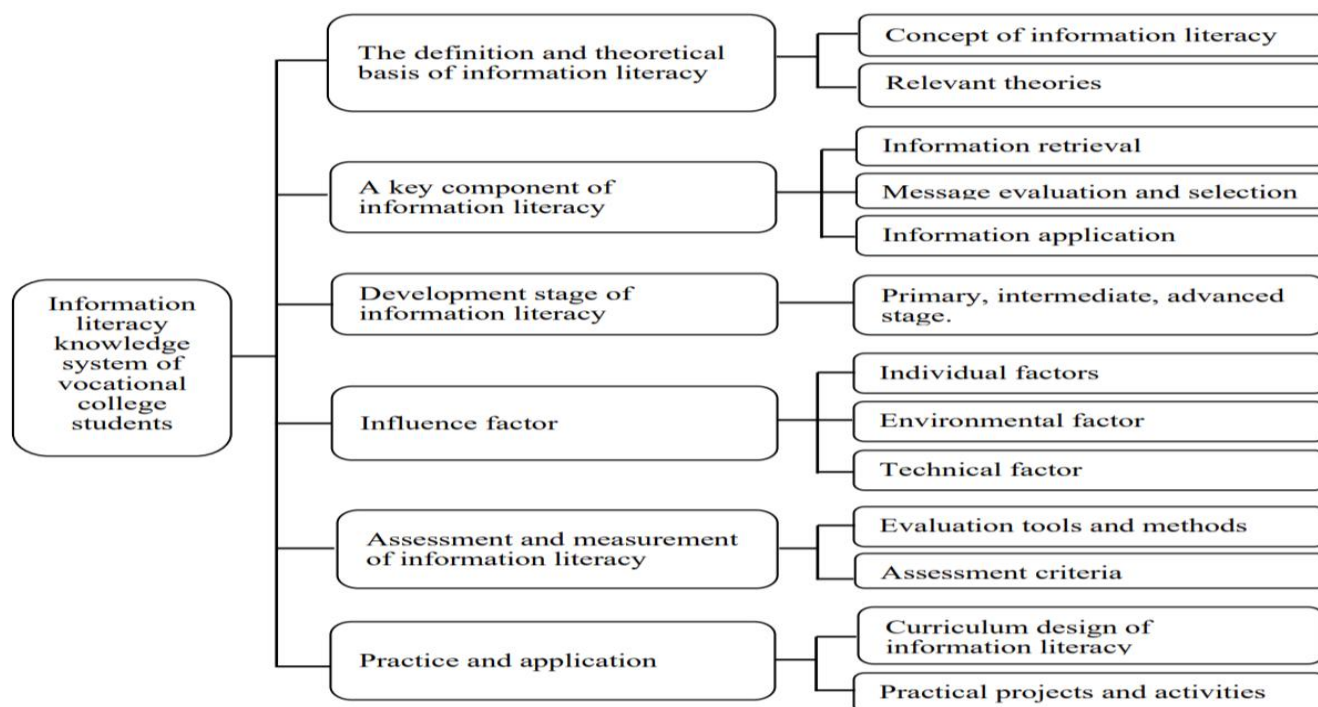


Figure 2 Body of knowledge

In this study, the researcher established a curriculum design model, organizing curriculum modules based on empirical research results on students' needs, ensuring that the curriculum modules were arranged in a clear order that met actual needs, and helping students truly acquire knowledge and skills. At the same time, establish a standardized assessment system and a teacher training framework, support policy integration, so that vocational education in higher vocational colleges can meet the requirements of national policies and achieve the goal of strengthening the entire vocational education system.

The researcher also fully considered the special needs of the agricultural environment, combined with the framework of information literacy development, and achieved the wide application of the research results in different fields with high flexibility, highlighting its wide applicability and importance. The comprehensive solution proposed by the research not only meets the learning needs of students and conforms to national policies, but also has strong industry adaptability, providing impetus for the development of vocational education.

Suggestions

Based on the current research achievements and the deficiencies found, in order to further improve the information literacy level of vocational students, the subsequent research directions are proposed. The suggestions for these research directions are intended to closely integrate theoretical knowledge with practical applications, while effectively responding to the continuously evolving educational environment and the rapidly developing technological situation.

1. In terms of interdisciplinary teaching and emerging technology research, it is necessary to actively explore strategies for effectively embedding information literacy into interdisciplinary teaching. By integrating the knowledge systems and teaching methods of different disciplines, a complete interdisciplinary teaching model can be constructed. At the same time, it is necessary to focus on examining the adaptation performance of vocational students in the face of emerging technologies such as artificial intelligence and big data, and comprehensively evaluate the role and impact of these emerging technologies in improving the information literacy and mastering professional skills of vocational students.

2. In terms of course customization and case studies, analyzing the specific information literacy requirements of various industries is helpful for vocational schools to customize courses. Successful cases of other institutions can be collected and studied to determine effective methods for curriculum improvement from them.

3. In terms of educational assessment and guideline revision, in order to scientifically and effectively evaluate various intervention measures implemented for vocational students, it is necessary to establish a clear and operational assessment index system. It is also necessary to conduct a comprehensive review and revision of the existing management guidelines on a regular basis to enable them to adapt to the constantly changing technology and job market, thereby ensuring the relevance and effectiveness of the management guidelines in guiding the practice of vocational education.

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