



Original Research Article

Research on Information Literacy Education in Higher Vocational College Libraries in China

Xiaojuan Zhang¹, Jianlan Zhang^{2,1}, Shuyuan Li^{3*}, Hanlu Zhang⁴ and Farhan Khan⁵

Abstract

¹School of Information Management,
Wuhan University, Wuhan, China,
Professor.

²Library of Yancheng Institute of
Industry Technology, Yancheng, China,
Librarian.

³Information and Archives Center,
Wuhan Second Ship Design and
Research Institute, Wuhan, China,
Librarian.

⁴Records Management Office, Chengdu
Aeronautic Polytechnic, Chengdu,
China, Assistant Librarian.

⁵Department of Government and Public
Policy, National Defence University,
Islamabad, Pakistan, Assistant
Professor.

The higher vocational college libraries have been playing an important role in information literacy education in China. However there are relatively few studies on the overall picture of higher vocational colleges across the whole country. This paper aims to, through the sampling and analysis of 56 high-level vocational colleges, fully understand the present situation of information literacy education in higher vocational college libraries in China. This paper first establishes an evaluation index of information literacy education in higher vocational college libraries on the basis of existing theories and survey data. It then adopts expert review and analytic hierarchy process to further improve the evaluation index, followed by comprehensive investigation and statistical analysis and evaluation according to the tool of study, namely the evaluation form of information literacy education of higher vocational college libraries, and its practices in 56 such libraries. The evaluation index of information literacy education in higher vocational college libraries has demonstrated its field utility. The results show that there are differences across regions and subject specialties in information literacy education carried out by higher vocational college libraries for students, as well as a significant gap in the performance of information literacy education among different colleges. The research result proves that the standards this paper has established for evaluation of information literacy education in higher vocational college libraries are notably applicable.

*Corresponding Author E-mail:
572856624@qq.com

Keywords: Higher vocational college libraries, information literacy education, high-level vocational colleges.

INTRODUCTION

In recent years, China has paid ever greater attention to vocational education. In 2019, the State Council issued *Implementation Plan for National Vocational Education Reform*. This document urges the development of high-quality higher vocational education, as well as calling for more attention to connotative development and shifting the training mode from pursuing scale expansion to quality improvement and an orientation towards cultivation of high-quality composite technical and skilled personnel (The State Council, 2021). To meet such needs, it is necessary to better nurture students' overall quality and skills.

In order to promote the reform and high-quality

development of vocational education, the Ministry of Education and the Ministry of Finance issued the *Circular on the Administrative Measures for Selection of Development Projects of High-level Vocational Colleges and Specialties with Chinese Characteristics (Trial)*. The Circular puts forward the plan of developing high-level higher vocational colleges and specialties with Chinese characteristics ("Double-high Plan" for short). The "Double-high Plan" is known as the "Double First-class" in the field of vocational education. The Ministry of Education will allocate more than 2 billion CNY for the implementation of this plan and concentrate efforts to build up about 50 high-level higher vocational colleges

and 150 high-level specialties. This plan is jointly formulated and implemented by the Ministry of Education and the Ministry of Finance. The issuance of such a circular marks the official start of "Double-high Plan" (Circular of the ministry of education and the ministry of finance on printing and issuing the administrative measures for the selection development projects of high-level vocational colleges and specialties with Chinese characteristics (trial), 2021). Later in the same year, the two ministries announced the list of high-level vocational colleges with Chinese characteristics included in the "Double-high Plan". There are 56 high-level vocational colleges with 10 in Class-A, 20 in Class-B and 26 in Class-C are on the list (The Ministry of Education, and the Ministry of Finance, 2021). It can be said that these 56 high-level vocational colleges are strongly representative and exemplary. How to acquire information through multiple channels and get the truth from the ocean of information is a basic skill that college students must develop in the current times. How to improve the information literacy of college students such as information awareness and information ethics is an important issue faced by the higher vocational college libraries. The libraries assume an indispensable mission in this regard, and being the main player of information literacy education, their role is self-evident (Sun, 2011).

The higher vocational college libraries have been playing an important role in information literacy education in China. However there are relatively few studies on the overall picture of higher vocational colleges across the whole country. In order to fully understand the present situation of information literacy education in higher vocational college libraries in China, this paper establishes the evaluation standard of information literacy education in higher vocational college libraries. It also, based on the evaluation standard, conducts an overall evaluation of the information literacy education carried out by vocational college libraries for students and put forward some suggestions on facilitating their work.

Literature Review

Since the 1970s when Paul G. Zurkowski, the then chairman of Information Industry Association (IIA), proposed the term "information literacy" (Paul and Jeffrey, 2016), international understanding and practice of information literacy have undergone many developments and changes. These changes involve the contents (Chen and Gao, 2018), models (Wu and Sun, 2020) and other dimensions of information literacy education. For example, the library of the State University of New York at Albany has set up incentive badge systems, digital stories and other educational contents to enhance the cultivation of critical thinking and self-reflection (Kelsey,

2020). In many foreign countries, Massive Open Online Courses (MOOC) and offline face-to-face teaching are organically combined to their respective advantages, broadening the teaching modes and improving the teaching quality (Huang et al., 2014). For example, the School of Information Science of the University of Pittsburgh adopts a variety of teaching modes including online learning, internship, project discussion, scheduled learning and etc., (Wang and Wenlin, 2017) on the basis of face-to-face teaching, so as to realize the synchronous updating of online and offline teaching contents and cultivate students' independent learning ability.

As early as in 2002, the Chinese Ministry of Education issued *Rules and Regulation on Libraries in Institutions of Higher Education (Revised)*. This document points out that the libraries should carry out information literacy education for readers and, if conditions permit, the libraries can establish a professional teaching and research section on information literacy education and offer the related courses to cultivate students' information literacy and information retrieval ability in multiple ways (Ye, 2013). In the same year, Xu Lu published a paper titled "Information Literacy Education in Higher Vocational Colleges". In this paper, Xu called on higher vocational colleges to lay importance to information literacy education (Xu, 2002). This paper marks the start of studying information literacy education in Chinese higher vocational colleges. Since then, higher vocational colleges have begun to study the theory and practice of information literacy education. In the paper *Introduction to Information Literacy Education in Higher Vocational College Libraries*, Liu Xiaoming believed that information literacy education is an educational activity which aims to cultivate the educated's ability to acquire, evaluate and use the information in terms of information awareness, information concept, information ethics, information knowledge and information skills and improve the people's information literacy (Liu, 2011). With the practice of MOOC embedded information literacy education in the library of Panjin Vocational and Technical College as example, Zhou Hui pointed out that online education platform plays an important role in information literacy education in higher vocational college libraries, and proposed the approaches to apply MOOC in information literacy education in these libraries (Zhou, 2018).

Most of the research on information literacy education of domestic higher vocational colleges focus on the case study of certain higher vocational colleges (Li and Zhou, 2015; Li et al., 2018; Cao, 2019; Zhou, 2017) or them in certain regions or provinces (Yuan, 2013), while there are relatively few studies on the overall picture of higher vocational colleges across the whole country. In order to fully understand the present situation of information literacy education in higher vocational college libraries in China, this paper analyzes and evaluates the overall

Table 1. Information literacy education index specified in National Evaluation Index System of Higher Vocational College Libraries.

Second-level indicators	Third-level indicators	Points	Specific items and scores
E3 Information Literacy Education (38 points in total)	E31 Library entry education for freshmen	14 points	Whether library entry education for freshmen is included into the college's orientation plan for freshmen (3 points); Whether various forms of library entry education for all freshmen are carried out (3 points); Whether the paper or electronic version of "Library Guide" are provided to freshmen every year (2 points); Whether library entry education materials are provided to the freshmen through the library website (2 points), mobile library (2 points) and WeChat public service platform (2 points);
	E32 Information literacy course education	18 points	Whether the courses related to information literacy are provided and included into the college's curriculum (4 points); Whether there are specific textbooks (2 points); Whether online courses are prepared using modern educational technology theories and methods (4 points); Whether the online courses can be viewed and downloaded (2 points); Whether embedded information literacy courses are provided (2 points); Whether there are teaching and research section or teaching group for information literacy education courses (4 points);
	E33 Reader training	6 points	Is there any designated training site? (2 points); Whether more than 4 times of various forms of reader training per year are carried out (4 points). Points may be deducted in accordance with the actual delivery.

information literacy education performance of 56 high-level vocational college libraries based on the established standards for evaluation of information literacy education in higher vocational college libraries. Therefore, this paper is expected to be of certain practical significance.

MATERIALS AND METHOD

Based on the national higher vocational college library evaluation index, this paper clarifies the main contents and methods of information literacy education in higher vocational college libraries, and designs the first draft of the system for evaluation of their information literacy education. Then through repeated consultation with 11 experts, this paper improves the evaluation index, which includes five first-level indicators and 16 second-level indicators. The analytic hierarchy process was used to assign values to the evaluation index. Based on the second-level indicators and their weights, these indicators' specific contents were enriched and the applicable scoring table of information literacy education in higher vocational college libraries was designed. This was followed by online research and telephone interview and other means for qualitative and quantitative data gathering, and statistical analysis and evaluation on the information literacy education carried out by the 56 high-

level higher vocational college libraries for students, on the basis of the contents of the established evaluation index system.

Design of the index to evaluate the information literacy education in higher vocational college libraries

Selection of indicators of the evaluation index

In the section of National Evaluation Index System of Higher Vocational College Libraries (2016) (The Steering Committee of Library and Information Works in Higher Education Institutions of the Ministry of Education, 2021) on information literacy education, the evaluation index of information literacy education is divided into three third-level indicators, namely library entry education for freshmen, information literacy course education and reader training, as shown in Table 1. With reference to the above contents and in consideration of the extensive participation and important leading role of higher vocational college libraries in information literacy competitions in recent years, this paper regards the library entry education for freshmen, information literacy training and lectures, information literacy courses and information literacy competitions as the first-level

Table 2. The final evaluation index system of information literacy education in higher vocational college libraries.

First-level indicators	Second-level indicators	Contents of second-level indicators
New media platform	Platform diversity	There are a variety of new media platforms for information literacy education such as the library website, official WeChat account, and mobile library
	Frequency of update of platform information	Contents on information literacy education on the library website and official WeChat account are updated in a timely manner
	Learning resources on the platform	The platform has resources for information literacy education and columns of information literacy education
Library entry education for freshmen	Education media	Library entry education for freshmen is carried out through various media such as graphics, PPT, e-books, videos, games , etc.
	Education method	Entry education is carried out through multiple ways such as online learning and games and offline activities including visits, training courses and manual-reading
	Education contents	The contents of library entry education include introduction to the library, management system of the library, introduction to the resources of the library and how to access them, skills to use the electronic resources, etc.
Information literacy training	Training format	Training can be special training/lectures at fixed time and of certain brands, ordinary training, expert lectures, and resource introduction and recommendation, etc.
	Training frequency	The number of information literacy-related training lectures organized in the year
	Training contents	The training contents include information awareness, information acquisition, information organization and processing, information evaluation, information ethics and information security.
Information literacy course	Course hours	Hours of a single course
	Course scale	Number of students who select the course in the year
	Course contents	The course contents include information awareness, information acquisition, information organization and processing, information evaluation, information ethics and information security.
	Course team	There is a teaching group or teaching and research section
Information literacy competition	Competition scale	The information literacy competitions organized are in various forms and a wide range of people participate in them
	Competition results	Awards in information literacy competitions
	Supporting activities for the competition	There are training, courses, publicity and other supporting activities

indicators. In determination of the second-level indicators, the survey data was fully considered on the basis of referring to the national evaluation system of higher vocational college libraries. Thus, the evaluation index system of information literacy education in higher vocational college libraries was established.

Determination of the evaluation index

Expert opinions are required to scientifically establish the index. To this end, the opinions of 11 experts were

collected, including 3 academic researchers on information literacy education in universities, 2 library directors and 6 teachers of higher vocational college libraries who are responsible for information literacy education. These 11 experts formed an expert team and they don't communicate with each other. We kept in touch with each of them and asked for their independent opinions and judgments on the related issues. After organizing and summarizing the experts' opinions and feedbacks, we obtained a more consistent and reliable conclusion and finally determined the index system as shown in Table 2.

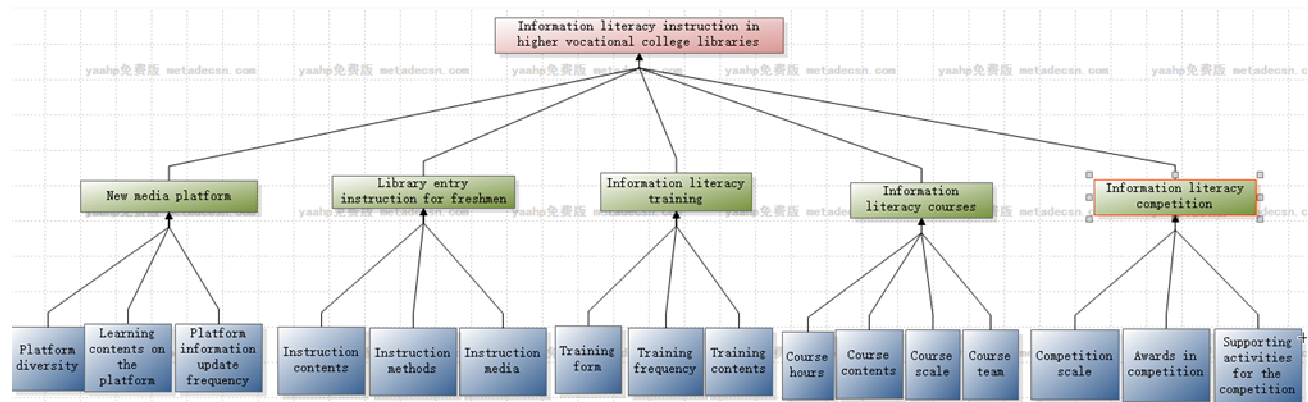


Figure 1. Hierarchical structure of information literacy education in higher vocational college libraries.

The analytic hierarchy process is a decision-making method that decomposes the elements related to decision-making into goals, criteria, and plans and performs qualitative and quantitative analysis on this basis. It can express and process people's subjective judgment in quantitative form, and is suitable for dealing with complex and vague problems that are difficult to fully quantitatively analyze. The specific steps are namely establishing the hierarchical structure model, constructing the judgment matrix, calculating the weight vector, doing the consistency test, and calculating the weight of the whole hierarchy (Guo et al., 2008). According to the principles and steps of analytic hierarchy process and the finalized evaluation system as shown in Table 2, this paper constructs the hierarchical model diagram of the "Evaluation Index System of Information Literacy Education in Higher Vocational College Libraries" with the aid of the Yet Another AHP(YAAHP) software as shown in Figure 1.

Determination of the evaluation form

This paper adopts YAAHP to calculate relevant data, handily completing the analytic hierarchy process. The weight of the index system was calculated through AHP group decision-making. In terms of the expert weight, the same value was assigned, that is $1/11=0.0909$. These 11 experts represent the aspects of theory, management and practice respectively.

After constructing the hierarchical structure model with the help of the YAAHP software, the relative importance of the indicators at the same level was judged by pair wise comparison according to the questionnaire filled by experts, and then the pair wise comparison judgment matrix was constructed. Generally, the measurement scale method of judgment matrix uses AHP (1 ~ 9 scale)

to judge factors in pairs. The relative weight of each indicator at each level, namely the relative weight coefficient, filled by each expert was calculated according to the judgment matrix, and then the consistency test was completed. Regarding the survey data on the opinions of the experts that failed the consistency test, the judgment matrix was then revised by consulting the experts again so that the filled-in results could meet the consistency requirements. We calculated the relative weight of first-level indicators with the results of the first-level indicators filled by an expert in the survey form as an example, as shown in Table 3.

After calculating the relative weight coefficient W_i of each expert at each level, the arithmetical average of the relative weight coefficient W_i of each expert was then derived. In this way, we can get the final weight coefficient. This was followed by the conversion of the weight of each indicator of information literacy education in higher vocational college libraries into percentage. The following Table 4 and Table 5 show the final weight coefficient of the first-level indicators and second-level indicators. Based on the scores, contents and preliminary investigations of the first-level and second-level indicators, the evaluation form of information literacy education in higher vocational college libraries was designed. The specifics are shown in Table 6.

Overall Evaluation of Information Literacy Education in Higher Vocational College Libraries

Sampling method, inclusion and exclusion criteria

This survey took 56 high-level higher vocational libraries as the objects and investigated the information literacy education activities released on the platform from February 2019 to January 2021.

Table 3. Weights of first-level indicators of information literacy education in higher vocational libraries.

Information literacy education of high vocational college libraries	New media platform	Library entry education for freshmen	Information literacy training	Information literacy course	Information literacy competition	Wi
New media platform	1	1	1/3	1/3	1/5	0.0719
Library entry education for freshmen	1	1	1/7	1/3	1/7	0.0548
Information literacy training	3	7	1	3	1	0.3471
Information literacy course	3	3	1/3	1	1/3	0.151
Information literacy competition	5	7	1	3	1	0.3752

Expert weight: 0.0909---Library information literacy education;
 Consistency ratio: 0.0253; weight for "library information literacy education": 1.0000; λ max: 5.1132

Table 4. Ranking of the final weight coefficients of the first-level indicators.

First-level indicators	Weight coefficient	Percentage weight
New media platform	0.1238	12
Library entry education for freshmen	0.1289	13
Information literacy training	0.2695	27
Information literacy course	0.2853	29
Information literacy competition	0.1925	19

Table 5. Ranking of the final weight coefficients of the second-level indicators.

Second-level indicators	Weight coefficient	Percentage weight
Platform diversity	0.0193	2
Learning resources on the platform	0.0225	2
Platform information update frequency	0.0819	8
Education contents	0.0667	7
Education method	0.0355	3
Education media	0.0268	3
Training format	0.0722	7
Training frequency	0.0596	6
Training contents	0.1376	14
Course hours	0.0392	4
Course scale	0.0328	3
Course contents	0.135	14
Course team	0.0783	8
Competition scale	0.0727	7
Awards in competition	0.0206	2
Supporting activities for the competition	0.0993	10

Table 6. Evaluation scoring form of information literacy education in higher vocational library.

First-level indicators and the score	Second-level indicators and the score	Contents of second-level indicators	Evaluation standard
information literacy education platform (12 points)	Platform diversity (2 points)	There are multiple information literacy education platforms, such as website and official WeChat account	The library has an official website, 0.5 points; The library website is accessible outside campus network, 0.5 points; The library has an official WeChat official account, 1 point
	Learning resources on the platform (2 points)	The platform has resources for information literacy education and columns of information literacy education	The platform has the full text of the learning resources about information literacy education, 1 point; The platform has an information literacy column, 1 point
	Platform information update frequency (8 points)	Contents on information literacy education on the library website and official WeChat account are updated in a timely manner	No annual update of the information on the website, 0 points; Annual update of more than one piece but less than four pieces (inclusive) of information; 1 point; Annual update of more than 4 pieces but less than 9 pieces (inclusive) of information, 2 points; Annual update of more than 9 pieces but less than 14 pieces (inclusive) of information, 3 points; Annual update of more than 14 pieces of information, 4 points; No annual update of the information on the official WeChat account; 0 point; Annual update of more than one piece but less than four pieces (inclusive) of information on the official WeChat account, 1 point; Annual update of more than 4 pieces but less than 9 pieces (inclusive) of information on the official WeChat account, 2 points; Annual update of more than 9 pieces but less than 14 pieces (inclusive) of information on the official WeChat account, 3 points; Annual update of more than 14 pieces of information on the official WeChat account, 4 points;
Library entry education for freshmen (13 points)	Entry education, media (3 points)	Library entry education for freshmen is carried out through various media such as graphics, PPT, e-books, videos, games and etc.	Graphic introduction, 1 point; PPT, 1 point; Video, 1 point; Games, VR, e-books and other multimedia, 1 point (Maximum 3 points for this item)

Table 6. Continues.

	Entry education method (3 points)	Entry education is carried out through multiple ways such as online learning and games and offline activities including visits, training and manual-reading	Online learning platform, 1 point; Online Q&A or learning game, 1 point; Offline visit, 1 point; Library guide, 1 point; Face-to-face education, 1 point; Others 1 point (Maximum 4 points for this item)
	Entry education contents (7 points)	The contents of library entry education include introduction to the library, management system of the library, introduction to the resources of the library and how to access them, skills to use the electronic resources, etc.	Introduction to the library and its management system, 2 points; Introduction to resources and ways to obtain them, 2 points; How to use electronic resources, 2 points; General education on information literacy, 2 points; (Maximum 7 points for this item)
Information literacy training (27 points)	Training format (7 points)	Training can be special training/lectures at fixed time and of a certain brand, ordinary training, expert lectures, and resource introduction and recommendation, etc.	Branded special training, 4 points; Ordinary lectures, resource introduction and recommendation, 2 points; Expert lecture, 2 points; (Maximum 7 points for this item)
	Training frequency (6 points)	The number of information literacy-related training lectures organized in the year	1.5 points each time (maximum 6 points for this item)
	Training content (14 points)	The training contents include information awareness, information acquisition, information organization and processing, information evaluation, information ethics and information security.	Information awareness, 2 points; Information acquisition, 4 points; Information organization and processing, 2 points; Information evaluation, 2 points; Information ethics, 2 points; Information security, 2 points;
Information literacy course (29 points)	Course hours (4 points)	Total hours of a single course	≥12 hours, 4 points; <12 hours, 2 points
	Course scale (3 points)	Number of students who select the course in the year	≥100 students, 3 points; 60 < number of students < 100, 2 points; Less than 60 students, 1 point

Table 6. Continues.

	Course contents (14 points)	The course contents include information awareness, information acquisition, information organization and processing, information evaluation, information ethics and information security.	Information awareness, 2 points; Information acquisition, 4 points; Information organization and processing, 2 points; Information evaluation, 2 points; Information ethics, 2 points; Information security, 2 points; (Maximum 14 points for this item)
	Course team (8 points)	There is a teaching group or teaching and research section	There is a teaching group or teaching and research section, 8 points
Information literacy competition (19 points)	Competition scale (7 points)	The information literacy competitions organized are in various forms and a wide range of people participate in them	Host college-level information literacy competition. 2 points each time; Participation in the provincial information literacy competition, 2 points each time; Participate in the national information literacy competition, 2 points each time; Host/ participate in other competitions, 2 points each time; Maximum points for this item: 7 points
	Awards in Competition (2 points)	Get awards in information literacy competitions	Students get award, 1 point; The library or the teacher gets awards, 1 point
	Supporting activities for the competitions (10 points)	There are training, courses, publicity and other supporting activities	There are relevant training arrangements and venues, 3 points; There is a teacher who is specially responsible, 3 points; There are related follow-up reports, 4 points

This paper mainly adopts the network research method. According to the content of evaluation index of information literacy education in higher vocational college libraries, we checked the activity columns and news of the library website or official WeChat account one by one to collect and summarize the information related to information literacy education activities. For those vocational college libraries whose websites are not accessible, have no website, have not operated an official WeChat account as well as the items are less publicly available on the Internet, we consulted the librarian over the phone to conduct the survey as objectively as possible.

Overall evaluation

According to the evaluation form as in Table 6 of

information literacy education we evaluated and scored the information literacy education in 56 higher vocational college libraries. It needs to be pointed out that the results of our evaluation are based on the survey of these 56 high-level vocational colleges and do not represent the average level of all vocational colleges across China. The scores of the higher vocational college libraries are shown in the following Table 7.

RESULTS

Regional differences exist in information literacy education in the higher vocational college libraries

Based on the above evaluation table, we can conclude that there are regional differences in the information literacy education in these 56 higher vocational college

Table 7. Evaluation of the information literacy education activities in high-level vocational college libraries.

N o.	College	New media platform	Library entry education	Training	Course	Competition	Score	Total score	Explanation for missing items	Final score
1	Beijing Polytechnic Library	7	8	11	0	18	44	71	Course Deficiency Items, 29 points	61.97
2	Beijing College of Finance and Commerce Library	4	4	9.5	16	16	49.5	96	Website inaccessible, missing item, 4 points	51.56
3	Beijing Polytechnic College Library	6	9	12.5	16	18	61.5	100		61.5
4	Tianjin Vocational Institute Library	10	9	20	24	19	82	100		82
5	Tianjin Medical College Library	3	4	2	18	4	31	96	Website inaccessible, missing item, 4 points	32.29
6	Tianjin Light Industrial Vocational Technical College Library	3	4	0	0	0	7	52	Course and competition deficiencies Items. Total of 48 points	13.46
7	Hebei College of Industry and Technology Library	5	10	0	0	6	21	100		21
8	Shanxi Finance and Taxation College Library	3	3	0	0	4	10	100		10
9	Inner Mongolia Technical College of Mechanics and Electrics Library	3	8	0	0	0	11	100		11
10	Liaoning Provincial College of Communications Library	7	11	16	16	14	64	100		64
11	Changchun Automobile Industry Institute Library	3	4	0	0	6	13	100		13
12	Harbin Vocational & Technical College Library	7	8	7.5	22	14	58.5	100		58.5
13	Shanghai Art & Design Academy Library	0	8	11	0	0	19	52	Course and competition deficiencies Items. Total of 48 points	53.52
14	Nanjing Vocational College of Information Technology Library	4	11	15	0	17	47	100		47
15	Changzhou Vocational Institute of Mechanic Technology Library	12	13	25	18	17	85	100		85

Table 7. Continues.

16	Changzhou College of Information Technology Library	6	13	15	18	17	69	100		69
17	Wuxi Institute of Technology Library	6	13	13	24	18	74	100		74
18	Jiangsu Agri-animal Husbandry Vocational College Library	7	7	6	0	16	36	71	Course Deficiency Items, 29 points	61.97
19	Jiangsu Institute of Commerce Library	7	9	18.5	19	16	69.5	100		69.5
20	Jiangsu Vocational College of Agriculture and Forestry Library	9	7	13	0	17	46	100		46
21	Jinhua Polytechnic Library	8	12	11	27	16	74	100		64
22	Zhejiang Institute of Mechanical & Electrical Engineering Library	7	13	13	18	14	65	96	Website inaccessible, missing items, 4 points	67.71
23	Zhejiang Financial College Library	9	10	15	22	18	74	100		74
24	Ningbo Polytechnic Library	10	10	23	25	13	81	100		81
25	Wenzhou Polytechnic Library	8	11	23	0	16	58	100		58
26	Hangzhou Vocational & Technical College Library	4	9	11	0	13	37	96	Website inaccessible, missing items, 4 points	38.54
27	Wuhu Institute of Technology Library	8	7	18.5	18	13	64.5	100		64.5
28	Fujian Chuanzheng Communications College Library	7	7	14.5	20	17	65.5	100		65.5
29	Jiujiang Vocational and Technical College Library	5	9	6	22	11	53	100		53
30	Shandong Institute of Commerce and Technology Library	7	7	6	1	13	34	100		34
31	Zibo Vocational Institute Library	9	11	22	18	16	76	100		76
32	Rizhao Polytechnic Library	7	13	14	18	13	65	100		65
33	Binzhou Polytechnic Library	6	8	13	0	7	34	100		34
34	Yellow River Conservancy Technical Institute Library	3	4	0	0	14	21	100		21
35	Wuhan Institute of Shipbuilding Technology Library	6	4	2	25	12	49	100		49

Table 7. Continues.

36	Changsha Social Work College Library	4	4	9.5	20	7	44.5	100		44.5
37	Hunan Railway Professional Technology College Library	5	10	9.5	0	7	31.5	100		31.5
38	Guangdong Industry Polytechnic Library	6	9	13.5	16	13	57.5	100		57.5
39	Shenzhen Polytechnic Library	7	9	22	27	19	84	96	Website inaccessible, missing item, 4 points	87.5
40	Shenzhen Institute & Information Technology Library	6	9	9.5	26	17	67.5	96	Website inaccessible, missing item, 4 points	70.31
41	Guangzhou Panyu Polytechnic Library	12	8	21	0	13	54	100		54
42	Shunde Polytechnic Library	12	11	20	27	17	87	100		87
43	Nanning College for Vocational Technology Library	9	8	20	18	12	67	100		67
44	Hainan College of Economics and Business Library	8	9	16	20	6	59	100		59
45	Chongqing Industry Polytechnic College Library	3	5	11.5	0	0	19.5	100		19.5
46	Chongqing College of Electronic Engineering Library	7	8	4	0	6	25	100		25
47	Sichuan Engineering Technical College Library	6	10	15	0	11	42	100		42
48	Guizhou Communications Polytechnic Library	3	5	5.5	0	5	18.5	100		18.5
49	Shaanxi Polytechnic Institute Library	10	13	11.5	0	12	46.5	100		46.5
50	Yangling Vocational and Technical College Library	8	6	13	18	11	56	100		56
51	Xi'an Aeronautical Polytechnic Library	6	5	4	0	11	26	100		26
52	Shaanxi Railway Institute Library	6	7	13	18	11	55	100		55
53	Ningxia Polytechnic Library	6	5	2	18	6	37	100		37
54	Xinjiang Agricultural Vocational Technical College Library	3	4	9	0	0	16	100		16
55	Kunming Metallurgy College Library	9	7	11.5	18	14	59.5	100		59.5
56	Lanzhou Resource & Environment Voc-tech College Library	4	9	4	0	13	30	100		30

Table 8. Performance of information literacy education in higher vocational college libraries classified according to regions.

Region	Number of vocational colleges	Mean/points	Max/points	Min/points
North China	9	38.8	82	11
Northeast China	3	45.2	64	13
East China	19	60.5	85	34
South China	8	68.47	87.5	54
Central China	5	39.8	53	21
Northwest China	7	38.1	56	16
Southwest China	5	32.9	59.5	18.5

Table 9. Forms of information literacy education in high-level higher vocational college libraries.

Type	Educational form	Frequency	Proportion	Subtotal
Combination 1	Library entry education	5	8.93%	8.93%
Combination 2	Library entry education + training & lectures	3	5.36%	
Combination 3	Library entry education + courses	1	1.79%	19.64%
Combination 4	Library entry education + competition	7	12.50%	
Combination 5	Library entry education + training & lectures + courses	2	3.57%	
Combination 6	Library entry education + training & lectures + competitions	11	19.64%	30.36%
Combination 7	Library entry education + courses + competitions	4	7.14%	
Combination 8	Library entry education + training & lectures + courses + competitions	23	41.07%	41.07%
	Total	56	100.00%	100.00%

libraries. Those in South China and East China perform better in information literacy education. The specific scores are shown in the following Table 8. The comprehensive colleges have a better performance than other types of colleges, with average score at 57.23. There is no significant difference between the finance colleges and the science and engineering colleges, with average scores of 49.68 and 46.7 respectively. The performance of medical colleges, art colleges, agriculture and forestry colleges and language colleges are lower, with the average score at 32.94.

There are sizable gaps in the development of these 56 colleges and some colleges have barely carried out any information literacy education. While Tianjin Vocational Institute Library, Changzhou Vocational Institute of Mechanic Technology Library, Ningbo Polytechnic Library, Shenzhen Polytechnic Library and Shunde Polytechnic Library have achieved relatively remarkable results in this regard.

Formats of information literacy education in higher vocational college libraries

Among these 56 high-level vocational college libraries, 8.93% only adopted only one method, namely library entry education, 19.64% employed two means, 30.36% applied three methods and 41.07% adopted four ways to carry out information literacy education. The specific combinations can be seen in Table 9. In total there are 24 colleges libraries which carry out information literacy education in four ways. It is found in the survey that most higher vocational colleges are pleased with their own functions of information literacy education. There are even four colleges that have set up information literacy education columns on the library websites. However, there are still shortcomings in the specific education contents and methods.

Suggestions for information literacy education in higher vocational college libraries

It is found from the above survey and analysis that there are regional differences in the information literacy education in Chinese higher vocational college libraries and the manners of delivery are incomplete. In view of these deficiencies, some suggestions are made with the hope of providing reference for information literacy education in higher vocational college libraries in China.

I. Strengthening the awareness of cooperation. Higher vocational college libraries should strive for the co-construction and sharing of resources in colleges, regions and industries, build regional alliances, strengthen academic contacts and promote college-enterprise resources integration. It is necessary to strengthen the formation of resource alliances with regional college libraries and public libraries, share literature and information resources, and co-organize subject competitions. They should give full play to the advantages of student associations, and organize students to carry out information competitions, reading festivals and other activities under the guidance of library teachers. They need to build college-enterprise cooperation and exchange platform, cooperate with local governments to establish information centers and form a team of information personnel represented by college, government and enterprise.

II. Fully tapping shared resources and reducing regional differences. In the era of Internet + education, higher vocational college libraries should make use of shared resource platforms to carry out information literacy education. This is conforming to the trend of the times and reflects the service able to advance continually. Meanwhile, they should also fully tap the shared resources on the Internet. For example, the library entry education test in Chaoxing Mobile Library and Rain Classroom can be adopted to carry out library entry education for freshmen, and MOOC platform can also be employed to provide online information literacy education courses.

III. Enriching the forms of information literacy education. The above survey and analysis show that only 41.07% of the higher vocational college libraries adopt multiple formats of information literacy education. This indicates that some higher vocational college libraries still do not have a deep understanding of their duties of carrying out information literacy education and do not prioritize it. Information literacy education in higher vocational college libraries should be implemented in multiple formats and angles.

LIMITATIONS

This paper naturally has certain limitations. In the process of research and survey, resources on websites of some higher vocational college libraries were not accessible. Some on-campus teaching resources cannot be browsed off site. Since the information on the information literacy education courses were only published on the campus network and cannot be acquired from an extranet, we had to interview the librarians by phone calls. Limited by the knowledge of the interviewees, there may be a risk of inaccurate information. In the future, survey on the information literacy ability of students of higher vocational colleges can be carried out. By this kind of survey, we aim to find out the relationship between the information literacy education of higher vocational college libraries and the information literacy ability of their students, and investigate the students' demand for and satisfaction with the information literacy education by libraries so that the libraries can make targeted adjustments and improve their information literacy education activities.

CONCLUSION

Based on the existing theories and with reference to the evaluation index system of higher vocational college libraries, this paper constructs the evaluation standard of information literacy education in Chinese higher vocational college libraries. According to the evaluation and scoring form of information literacy education and the overall evaluation of the information literacy education performance in 56 high-level higher vocational college libraries, it is found that the established standards for evaluation of information literacy education in higher vocational college libraries are notably applicable.

While most of the published research on information literacy education of domestic higher vocational colleges focus on the case study of certain higher vocational colleges, or them in certain regions or provinces, this paper has offered an overall evaluation of the general situation of higher vocational colleges libraries in China, which makes the work be of practical significances, especially for the state-level policy makers.

REFERENCES

- Cao G (2019). Exploration of subject-oriented embedded services in the higher vocational college libraries--case study of the library of Shunde Polytechnic[J]. *Information Research*, (01):107-111.
- Chen X, Gao Fan (2018). An overview of research on the information literacy

- education in domestic and foreign countries in recent five years[J].Library and Information Service, 2018(10):136-142.
- Circular of the ministry of education and the ministry of finance on printing and issuing the administrative measures for the selection development projects of high-level vocational colleges and specialties with Chinese characteristics (trial). [EB/OL].[2021-3-10]http://www.moe.gov.cn/srcsite/A07/moe_737/s3876_qt/201904/t20190417_378489.html..
- Guo J, Zhang Z, Sun Q (2008). Research and application of analytic hierarchy process[J]. China Safety Sci. J., 18(005):148-153.
- Huang R, Zhong Y, Xiong W (2014). Introduction to "information literacy education and MOOC": Investigation and analysis of MOOC of information literacy education at home and abroad[J] Library and Information, 2014(6):1-7.
- Kelsey B (2020). Using Badging as an open educational resource.[EB/OL]. [2020-10-20] .<http://www.academia.edu/11757108/using-Badging-as-an-open-educational-resource>.
- Li H, Pan R, Wang Y (2018). Exploration of professional librarian service in higher vocational college libraries——taking the library of Beijing polytechnic as an example[J]. Jiangsu Science and Technology Information, 35(06): 66-68.
- Li J, Zhou J (2015). An Empirical Study of the present situation and influencing factors of subject services in higher vocational college libraries--the example of Ningbo[J]. Library Research, 45(03):78-82.
- Liu X (2011). Introduction to information literacy education in higher vocational college libraries[J]. China Adult Education, (16): 64-65.
- Paul GZ, Jeffrey VK (2016). Translated and proofread by Zhang Xiaojuan, Liu Qianhui, Cheng Lu and et al. Information literacy: a journey with historical and practical significance[J]. Document, Information and Knowledge,000(003):33-38.
- Sun Yulan (2011). Research on the information literacy education of the students by the library of higher vocational college[J]. J. Lib. Inform. Sci. 21(006):87-89.
- The Ministry of Education, and the Ministry of Finance (2021). List of vocational schools included in the "Double-high Plan"[EB/OL].[2021-3-20].<https://m.gmw.cn/baijia/2019-10/26/33266478.html>.
- The State Council (2021). Circular of the state council on printing and issuing the implementation plan for national vocational education reform. [EB/OL].[2021-3-20].http://www.gov.cn/zhengce/content/2019-02/13/content_5365341.htm..
- The Steering Committee of Library and Information Works in Higher Education Institutions of the Ministry of Education (2021). National evaluation index system of higher vocational college libraries (trial)[EB/OL] [2021-3-20]. <https://tsg.arthn.com/info/1017/1252.htm>.
- Wang L, Wang W (2017). Graduate Curriculum System of Schools Universities in the Context of Big Data -- A Case Study of University of Pittsburgh[J]. Research In Library Science, (05):7-14.
- Wu W, Sun H (2020). Reflections on critical thinking-oriented information literacy education——enlightenment from the course "research and literature in the information age"[J]. J. North China Uni. Sci. Technol. (Social Science Edition), (4):36-40.
- Xu L (2002). Information literacy education in higher vocational colleges[J]. Communication of Vocational Education, (06):22-23.
- Ye H (2013). The characteristics of higher vocational college libraries[J]. Cooperative Economy and Science, (20):117.
- Yuan Y (2013). Analysis on the present situation and countermeasures of information literacy education in higher vocational colleges libraries -- a case study of 40 higher vocational college libraries in Guangdong Province[J]. The Library J. Henan, 3307:117-120.
- Zhou C (2017). Discussion on information literacy education in higher vocational colleges——case study of Shenzhen Polytechnic library[J]. J. Hubei Adult Edu. Inst., 2306:70-72.
- Zhou H (2018). Analysis on the information literacy education of higher vocational college library based on MOOC--a case study of Panjin Vocational and Technical College[J]. The Lib. J. Henan, 38(08):44-46.