



# Recent advances of information literacy education for international students in Chinese academic libraries

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## ABSTRACT

The author of this paper investigates the recent advances of information literacy education for international students at academic libraries in China. The author carried out a questionnaire survey through the Questionnaire Star platform from April 2019 to July 2020 among 152 librarians from 117 university libraries in different parts of China, including 35 librarians from the universities which participate in the country's construction plan of world-class universities and world-class disciplines. Moreover, another questionnaire survey on library information literacy education for international students was conducted among 35 international students in Shanghai Jiao Tong University. Through analysis and discussion of the survey results, the research studies the overall status and existing problems of information literacy education for international students in Chinese academic libraries, and offers suggestions for the improvement of international students' information literacy education in the future.

## Introduction

Nowadays, higher education in China is becoming increasingly internationalized. More and more international students are attending Chinese colleges and universities. According to the Ministry of Education of the People's Republic of China (PRC for short), there were 492,185 overseas students from 196 countries and regions studying in the universities and colleges of 31 Chinese provinces, autonomous regions and municipalities in 2018, which increased by 0.62% compared with that of 2017 (Ministry of Education of the PRC, 2019). Until 2019, China has become the largest destination in Asia for international students to study (State Council of the PRC, 2020).

In general, there were three new policies enacted by the Chinese government that contributed to the rapid increase of international students in Chinese universities. The first was the government's international student education plans. In 2010, the Ministry of Education of PRC enforced the "Outline of National Mid-term and Long-term Education Reform and Development Plan". It explains 20 aspects of international policies in Chinese higher education, such as the enrollment policies, academic courses, teaching staff, scholarship system, etc. The aim of the plan is to enhance the communication and cooperation between China and foreign countries, promote the smooth development of international student education, and advance the internationalization of

education in China (Ministry of Education of the PRC, 2010).

The second was the Belt and Road Initiative (BRI). In 2013, China proposed the BRI, namely, the initiative of jointly building the Silk Road Economic Belt and the 21st Century Maritime Silk Road, with the purpose of developing economic partnership with countries along the ancient Silk Road, a route over which silk fabrics and other products in the Han Dynasty 2000 years ago were transported to Southwest Asia and Europe, and jointly creating a common interest community of economic integration and cultural blending with these countries (China.org.cn., 2019). The BRI has promoted a rapid growth of international students from countries along the ancient Silk Road to pursue their higher education in China (International Education of China, 2017).

The third was the "Double First-Class" initiative. In 2015, in order to build first-rate universities and disciplines in China, the State Council of China issued the Overall Plan for Promoting the Construction of First-Class Universities and First-Class Disciplines (Double First-Class). The plan lists the improvement of communication and cooperation between China and foreign countries, recruitment of qualified teachers, innovative talent cultivation, etc., as part of the higher education reform agenda (Ministry of Education of the PRC, 2015). In 2017, a list of Chinese universities and colleges that are assigned to participate in the country's scheme of developing world-class universities and disciplines was released jointly by the Ministry of Education, and the Ministry of

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Finance and the National Development and Reform Commission of China. The measure is aimed at ultimately developing a number of world-class universities and subjects by the end of 2050 and to establish China's power in international higher education (People's Daily Online, 2017). Due to the policies, China gained a reputation for its quality of higher education around the world, and hence a growing number of international students have come to study in China.

International student education plays a crucial and irreplaceable role in the internationalization of higher education. A continuous improvement in international student cultivation conduces to enhance the international influence and competitiveness of colleges and universities (China Higher Education Reform and Development Network, 2020). It lays the foundation of developing First-Class universities and First-Class disciplines (Hu, 2018). Currently, in the context of higher education internationalization, academic libraries, an important teaching and learning support units, could back up the international student education and global talent cultivation in higher education institutions by organizing support services that aim at promoting information literacy (IL) among international students. The unique value and role of academic libraries thus stand out in the internationalization of higher education and the development of "Double First-Class" universities.

## Literature review

Scholars across the globe have conducted related research on information literacy (IL) education for international students in academic libraries. In China, research on IL education began in the 1990s. According to the search results in the database called CNKI (China National Knowledge Infrastructure) which integrates the vast majority of Chinese literature, and through which the research progress of different subjects in China could be reflected, the literature with the term "library" and "international students" began to emerge in China in 1990s. The earliest report on international students' IL education was published in 1994, in which Ning and Liu (1994) discussed how academic libraries provided quality services to foreign students, specifically on how information search skill training for international students was carried out. It was also during that period when IL education for international students started to develop. Since then, research on IL education for international students in Chinese academic libraries has gradually increased. Based on the investigation and analysis of the IL needs of international students, some researchers put forward related problems on relevant IL education and suggestions for the improvement. For example, according to a questionnaire survey of 100 international students from Beijing Jiaotong University, Li (2014) found that international students were relatively weak at using the library to meet their information needs due to lack of IL education. Therefore, she proposed suggestions for international students' IL education, including curriculum design, and ways to improve the existing teaching materials, teaching methods, etc. Luo (2016) used questionnaire surveys, telephone interviews, e-mail consultations, online surveys, and other methods to interview 376 ethnic Chinese international students from Jinan University and Huaqiao University in China. The purpose of the survey was to understand individual needs of ethnic Chinese international students in terms of their IL level, preferences and tendencies; based on the results, the strategies to extend services for ethnic Chinese international students were proposed. Deng et al. (2020) learned about the status of IL education for international students in China, conducted a questionnaire survey sent to international students in Guangxi Medical University, and proposed the measures to improve the IL of foreign students.

Some other Chinese researchers have summarized successful cases of IL teaching practices for foreign students in academic libraries. For instance, Harbin Engineering University Library launched an information retrieval course in English for international graduate students in 2010. The course was characterized by the practice-oriented teaching content and the fusion of various teaching methods (Chen, 2011). Shanghai Jiao Tong University Library had been offering different kinds

of IL training for international students at 6 departments of the university until 2019, such as library orientation, embedded instruction in academic courses, and tailored training on specific topics (Huang et al., 2018). Zeng (2019) proposed a multi-level IL education program tailor-made for international medical students pursuing bachelor's and master's degrees, with reference to the overall planning, teaching content, and teaching methods of different IL courses for international students offered by Southwest Medical University, as well as the comparative analysis of different IL education needs of foreign students at undergraduate and postgraduate levels. Li (2020) introduced Anhui Medical University's reform of IL teaching for master and doctoral students, and put forward suggestions for IL instruction.

Still some other scholars did research on international students' IL education in the context of the new governmental policies. For instance, Xu et al. (2020) conducted a survey on IL education approaches adopted by "Double First-Class" university libraries in China. Based on the survey, the author suggested that IL education of university libraries should focus on online instruction, embedded instruction, and instruction for international students. However, relevant research was mainly about the analysis of IL teaching needs and related teaching practices of international students in certain or several domestic universities, resulting in a lack of research on the current situation, existing problems and developmental countermeasures of IL education for international students in all Chinese academic libraries.

Foreign scholars carried out relevant research on IL education provided by university libraries for international students as well. Their studies started earlier than those in China, and the earliest report began in the late 1960s. In 1969, Wright et al. (1969) studied the IL needs and behaviors of graduate students including international students. After that, more scholars did research on IL education for international students. Some scholars elaborated on theories and practices of international students' IL education. For example, Sánchez-Tarragó et al. (2017) performed a review and analysis of the literature published in Information Science between 2005 and 2015. The published research led by librarians from the United States, China and Canada, etc., addressed different aspects of library work that supported both transnational education and internationalization in their countries, namely, supporting study-abroad students and programs, IL and so on. Nowrin et al. (2019) pointed out that there had been very little attention paid to the multilingual and multicultural aspects of IL. They pointed out that the content of an IL program was probably invariant for users of different languages and cultures, but the pedagogical approach, the examples used and the details of the IL content should be adapted. Some other researchers did research on new methodologies used in IL education for international students. For instance, Hughes et al. (2016) presented a flipped learning approach in the library orientation for international university students. The approach was trialled through the project Passport to Study with 98 new international students at Queensland University in 2015 to support the university's First Year Experience program, aiming to raise international students' awareness of the library as a supportive social learning space and develop foundational information and academic literacies. Sample (2020) introduced the Oral Roberts University (ORU) Library's practice of IL instruction redesign and early development of inclusion of Augmented and Virtual Reality in IL instruction for nontraditional and international students respectively. However, research carried out abroad still lacks investigation into the current situation and future development countermeasures for international students' IL education in Chinese university libraries.

In summary, both Chinese and foreign scholars have conducted research on IL education for international students in university libraries in theoretical and practical aspects, but there is a lack in research on the overall status of, problems of and development measures for IL education for international students in university libraries in China. Thus, the author of this paper utilized the questionnaire survey, "a technique for gathering statistical information about the attributes, attitudes or actions of a population by administering standardized questions to some or

all of its members" (Preston, 2009), and based on two questionnaire surveys about IL education for international students in Chinese academic libraries, the author examines the status of this IL educational service in Chinese academic libraries, analyses the existing problems, and further provides advice for its future development.

## Objectives and methods

### Objectives

Generally, through data statistics and analysis of the questionnaire surveys on information literacy (IL) education for international students at university libraries in China, the author aims to:

1. To a certain degree, understand Chinese university librarians' attitudes towards and awareness of IL education for international students, including librarians' opinions about the IL education's necessity, and their level of attention paid to and engagement in the IL education.
2. To a certain degree, understand the international students' IL ability levels, their IL education needs and engagement in library IL education, and know about the current practice and existing problems of IL education for international students in Chinese academic libraries.
3. Propose suggestions for improving IL education for international students in academic libraries and provide reference for the sustainable development of international students' IL education in academic libraries based on the problems identified in the questionnaire surveys.

### Methods

The author investigated and analyzed the status quo of international students' IL education in Chinese university libraries by using the questionnaire surveys over the Internet targeting at Chinese university librarians. Generally, questionnaire surveys could be conducted in face-to-face interviews in which an interviewer asks questions and records the answers, or self-administered questionnaires sent to the interviewee's homes, by email, or via the Internet, and are filled in by the interviewees themselves independently. Nowadays, increasingly more researchers carry out surveys over the Internet so as to collect and analyze the data automatically with related questionnaire system (Preston, 2009). To improve the work efficiency and get more survey results, the author of this paper also conducted the questionnaire surveys in the form of self-administered questionnaires sent to the interviewees through the Internet. In order to know about how the other researchers designed the questionnaire on IL education for international students in academic libraries, the author conducted a literature survey of scholarly sources on the relevant topic, that is, did a survey of academic literature which is related to designing questionnaires on IL education for international students in academic libraries, and identified the articles that are helpful for the questionnaire design. For example, Julien et al. (2018) designed an online survey sent to professional librarians in America who provided IL instruction in academic libraries. The survey data included such aspects as current pedagogical methods, assessment and evaluation, marketing, the role of technology in instruction, the importance of relationships with faculty and administrators, and a range of common challenges faced by instructional librarians, etc. Aharony et al. (2020) also carried out an online survey about IL instructional practices in Israeli academic libraries to understand the methods and approaches used by academic librarians in their instructional work.

For the purpose of fully reflecting the advances of international students' IL education in Chinese academic libraries, the author designed two questionnaire surveys, namely, the survey targeted at the librarians plus the survey targeted at international students. Although these two surveys used different questionnaires with different participants from

different universities, the author did the data statistics and analysis of these two surveys by means of the professional questionnaire survey platform—Questionnaire Star platform,<sup>1</sup> that is, the Questionnaire Star platform record, calculate and analyze the survey results automatically. Besides, because the questions of the two surveys are about different aspects of the same theme—international students' IL education in Chinese university libraries, so the author could compare the two groups of survey results to show their common issue—international students' IL education, despite that the two surveys were carried out in different periods.

### Librarians' questionnaire

By referring to the above-mentioned literature, the author designed a questionnaire which includes 10 single select multiple-choice questions and 5 multiple select multiple-choice questions on IL education for international students targeted at the librarians in Chinese academic universities (hereinafter referred to as "questionnaire 2", see "Appendix B" of the article for details). The questionnaire includes the following four aspects:

1. Chinese university librarians' impression about international students' IL abilities, and their knowledge about and attitude towards IL education for international students, including the librarians' general impression about international students' IL abilities, librarians' awareness of the necessity and importance of improving international students' IL abilities, and the level of attention librarians paid to international students' IL education. The corresponding survey questions include the following.
  - (1) What do you think of the IL abilities of international students in your university?
  - (2) Do you think it is necessary to carry out IL education for international students?
  - (3) Do you think your library attaches importance to IL education for international students?
2. International students' needs for IL education in Chinese academic libraries, including the sources where the IL education needs are from. The corresponding survey question is as follows.
 

What are the sources from which librarians know about the international students' IL education needs?
3. The current practices of IL education for international students in Chinese university libraries, including the proportion of universities that have carried out the IL education, the frequency, coverage of schools or departments, number of participants, types of IL training, teaching methods and languages used in the IL instruction, teaching content, teaching staff composition, and teaching effect of the IL education. The corresponding questions include the following.
  - (1) Has your library carried out IL education for international students in the university?
  - (2) What is the frequency of IL instruction sessions targeted for international students in your library?
  - (3) How many departments whose international students participated in the IL educational events offered by the library?
  - (4) How many participants are there in the international students' IL education events offered by your library each year?
  - (5) What are the types of IL education for international students in your library?
  - (6) What teaching methods does your library usually use to carry out IL instruction for international students?
  - (7) What languages do librarians use in international students' IL instruction in your library?

<sup>1</sup> The professional questionnaire survey platform is available at <https://www.wjx.cn/>.

- (8) What are the main contents of IL education for international students in your library?
  - (9) What is the composition of the IL instructional team for international students in your library?
  - (10) How effective do you think the IL education for international students is in your library?
4. The Chinese university librarians' view about the main challenges of the international students' IL education. The corresponding question is as follows.

What do you think are the main challenges in carrying out IL education for international students in Chinese academic libraries?

Two principles are adopted in the selection of the universities to be surveyed. The first is to ensure coverage of the 42 First-Class universities jointly released by the Ministry of Education, Ministry of Finance, and National Development and Reform Commission of the PRC in 2017. The First-Class universities were selected by the Chinese authorities and could get sustained government support to be developed into world-class educational institutions (China.org.cn, 2019), so they could represent the higher level of domestic universities in many aspects. Their affiliated libraries are also considered as the role model for other academic libraries to learn from, and their various services such as IL education is regarded as the epitome of the operation of Chinese university libraries. The second is to cover as many types of universities as possible in all regions of China, i.e., the eastern, western, southern, northern, and central regions, to ensure the representativeness and universality of the survey results.

From April 2019 to July 2020, the author used the Questionnaire Star platform to carry out questionnaire 2. 152 librarians who worked on tasks related to IL education at 117 universities that admit international students were invited to take part in the questionnaire survey through email and such social media as QQ,<sup>2</sup> WeChat.<sup>3</sup> Regarding multiple responses from a single university, the author had compared them and found that they were either in line with or were complementary to each other, so they should all be considered in the statistics. The 152 questionnaires returned were all valid according to the Questionnaire Star platform's automatic reporting. Concerning universities the 152 librarians belong to, 35 of them work in 28 First-Class universities which constitute 67% of the 42 First-Class ones. In terms of the location of the universities covered in the questionnaire survey, the 117 universities are located in various regions of China, including the eastern, western, northern, southern, and central regions. Most of them lie in northern China (47, 40%), followed by the eastern (29, 25%) and the western (17, 15%). A small number of them are situated in the central (15, 13%) and the southern region (9, 8%).

#### *International students' questionnaire*

Before the librarians' questionnaire ("questionnaire 2") were conducted, the author firstly carried out an IL questionnaire survey targeted at 35 international students in Shanghai Jiao Tong University (hereinafter referred to as "questionnaire 1", see "Appendix A") from December 2018 to March 2019 through the Questionnaire Star platform, and analyzed the information retrieval methods, IL education needs, teaching method preferences of international students, and their general impression about library training events. All 35 questionnaires collected were valid according to the Questionnaire Star platform's automatic reporting.

#### **Results**

The author summarized the results of 35 questionnaires on

international students' information Literacy (IL) education needs and preferences ("questionnaire 1") into the following five aspects, and 152 questionnaires concerning international students' IL education in Chinese academic libraries ("questionnaire 2") into the following fifteen aspects respectively through statistical analysis, ranging from international students' IL preferences, needs and abilities to the main challenges for implementing international students' IL education in Chinese academic libraries.

#### *International students' questionnaire (questionnaire 1)*

##### **1. Approaches international students using to search academic resources (multiple select)**

According to questionnaire 1, among the surveyed 35 international students, 60% of them (21 people) searched academic resources through the free search engines, only 31% (11 people) accessed resources through the library search engines and 37% (13 people) through the library databases. The results showed that most of the international students used the free search engines instead of the library search engines or library databases to search academic resources.

##### **2. Frequency international students taking part in the library IL training events**

According to questionnaire 1, only 9% (3) of the international students often took part in library IL training events, 9% (3) of them took part in the events for several times, 54% (19) of them seldomly participated in the events, and 28% (10) of them never took part in the events. These showed that most of the international students seldomly or never took part in the library IL training events.

##### **3. International students' view about the necessity of library IL training events for them**

According to questionnaire 1, 91% (32) of the international students think it is necessary for the library to provide IL training events for them. Among them, 34% (12) of them think it is quite necessary. It is hence clear that majority of the international students think it is necessary for the library to offer them IL training events.

##### **4. Instructional methods international students prefer in library IL training events (multiple select)**

According to questionnaire 1, only 20% (7) of the international students like the traditional instructional methods, i.e., teacher-centered teaching methodology, 46% (16) of them prefer new teaching approaches such as librarians offering the instructional materials to them before class, 34% (12) of them prefer librarians posting the instruction videos online for them to study online. These showed that most of the international students are fond of new teaching methods in library IL training events.

##### **5. International students' view about the benefit of library IL training events for them**

According to questionnaire 1, 88% (14 among 16 international students who had taken part in library IL training events) of the international students think the library IL training event is beneficial to them, and 50% (8 among the 16 students) of them think it is very beneficial. The above data showed that majority of the international students recognize benefit of library IL training events.

#### *Librarians' questionnaire (questionnaire 2)*

##### **1. IL abilities of international students**

According to questionnaire 2, among the 152 surveyed librarians, only 30% of them (45 people) reported that the international students in their universities had good IL ability while 70% of them (107 people) held that IL ability of international students in their universities were poor. Hence, the participants in this study, in general, perceive that most of the international students in Chinese universities need to improve their IL.

<sup>2</sup> QQ is available at <https://im.qq.com/pqq/>.

<sup>3</sup> WeChat is available at <https://web.wechat.com/>.



## 2. Respondents' view on the necessity of international students' IL education

97% (147) of the surveyed librarians agreed it was necessary for the libraries to provide IL education for the international students, of which 47% (72 people) said it was very necessary, and 78% (21 people) of the 27 "First-Class" university librarians participating in the survey thought it was very necessary. It is thereby clear that the academic librarians generally agreed with the necessity of providing IL education for international students.

## 3. 3 Importance libraries attached to IL education for international students

48% of the librarians (73 people) reported that their libraries attached importance to IL education for international students while 52% (79) of them reported that their libraries paid little regard to this kind of IL education. The result showed that more than half of the surveyed librarians maintained that IL education for international students was not regarded as a priority in their libraries.

## 4. Sources from which librarians know about the international students' IL education needs (multiple select)

As shown in Fig. 1, 35% of the librarians (53 people) reported that faculty members from various departments took the initiative to contact librarians about the international students' IL education needs, 27% (41) of them actively contacted the faculty and staff from different departments of the university, 16% (25) of them received requests when visiting faculty members, and 17% (26) of them mentioned other sources from which librarians know about the international students' IL training needs, such as subject librarians receiving requests from the Foreign Affairs Office of the university, and international students taking IL courses as electives. These showed that the international students' IL training demand were from diverse sources, including training requests from the faculty and staff, and librarians' initiatives of contacting the faculty and staff, etc., through which a certain amount of the IL educational needs of international students were satisfied.

## 5. Percentage of libraries carrying out IL educational events for international students

50% of the librarians (76 people) from 117 universities reported that their libraries had carried out IL educational events for international students, and 28 librarians from 28 double first-class university libraries, which takes up 67% of the 42 double first-class ones, reported that their libraries had carried out this kind of IL education. However, 50% (76) of them reported that their libraries had not yet carried out this type of IL education. The data showed that half of the surveyed Chinese university libraries had not yet implemented IL education for international students. To some extent, it could be concluded that the IL education for international students in Chinese academic libraries was still not so widespread.

## 6. Frequency of IL instruction sessions for international students

Among the 76 librarians who reported that their libraries had carried out IL education for international students, 11% (8 of the 76 librarians) mentioned that their libraries held more than 10 training sessions for international students per semester, 13% (10 of the 76 librarians) organized 6 to 9 sessions per semester, 33% (25 of the 76 librarians) arranged 2 to 5 sessions per semester, and 43% (33 of the 76 librarians) held less than 2 sessions per semester. It was therefore clear that even in universities that had carried out IL education for international students, the frequency of relevant practice was not high since nearly half (43%) of the universities organized less than 2 training sessions per semester.

## 7. Number of departments whose international students participated in the IL educational events offered by the library

Among the 76 librarians, 17% (13) of them reported that their libraries provided IL training for international students from 7 or more departments, 14% (11) offered IL education for those students from 5 to 6 departments, 25% (19) for those students from 3 to 4 departments, and 43% (33) for those students from 1 to 2 departments. However, the author investigated Top 5 universities of 2021 Academic Ranking of World Universities in China,<sup>4</sup> that is, Tsinghua University, Peking University, Zhejiang University, Shanghai Jiao Tong University, and University of Science and Technology of China, and found that average number of departments within these universities is 39. These data showed that there were not so many departments whose international students participated in the IL education offered by the library since most (68%) of the university libraries only provided IL education for international students from 1 to 4 departments of the university.

## 8. Number of participants in the international students' IL training sessions offered by the library

Among the 76 librarians, 9% (7 people) reported that their libraries had more than 200 participants a year in the international students' IL training sessions offered by the library, 25% (19) had 100–199 participants, 22% (17) had 50–99 participants, and 43% (33) had less than 50 participants. The results show that most (65%) university libraries had less than 100 participants in the IL training for international students each year, including domestic students simultaneously participating in the training sessions.

## 9. Types of IL education for international students (multiple select)

Among the 76 librarians, 54% (41 people) reported that their libraries provided training for first-year international students, 47% (36) carried out training series for international students on specific topics, and 42% (32) offered IL courses for international students (including elective courses instructed in Chinese open to all domestic and international students), and 26% (20) embedded IL instruction in various courses for international students. It is apparent that international students' IL education at university libraries in China was mainly in the forms of freshmen training (54%), training series on specific topics (47%), and IL courses (42%), which were at a similar level compared to the forms of information literacy training provided for domestic students.

## 10. Languages librarians used in international students' IL instruction

Among the 76 librarians, 51% (39 people) reported that their libraries used English, 39% (30) used Chinese (to teach students from South Korea), 22% (17) used both Chinese and English, and 4% (3) used other languages such as German. These data show that the IL education for international students was mainly (73%) offered in English or in both Mandarin and English while German and other foreign languages (4%) were also used for teaching at Chinese university libraries. The diverse instructional languages met the international students' individual needs for information literacy.

## 11. Composition of the IL instructional team for international students (multiple select)

As shown in Fig. 2, concerning the IL instructional teams for international students, among the 76 librarians, 77% (59) reported that their libraries were composed of librarians with academic background in the English language or education background of studying abroad, 61% (46) consist of members of the IL instructional team of the library, 51% (39) comprised librarians good at English, 21% (16) were made up of young librarians, and 8% (6) were composed of international student

<sup>4</sup> 2021 Academic Ranking of World Universities is available at <http://www.shanghairanking.com/rankings/arwu/2021>.

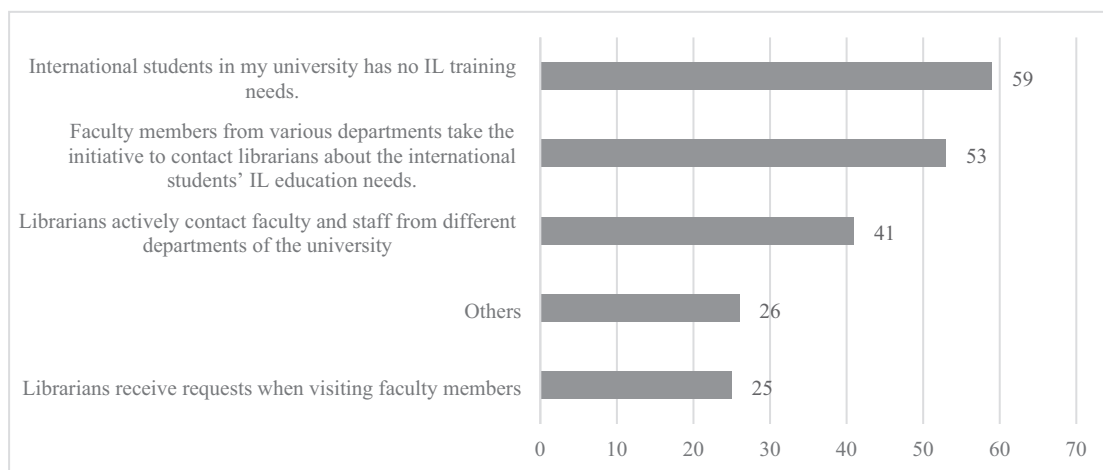


Fig. 1. Sources from which librarians know about the international students' IL education needs.

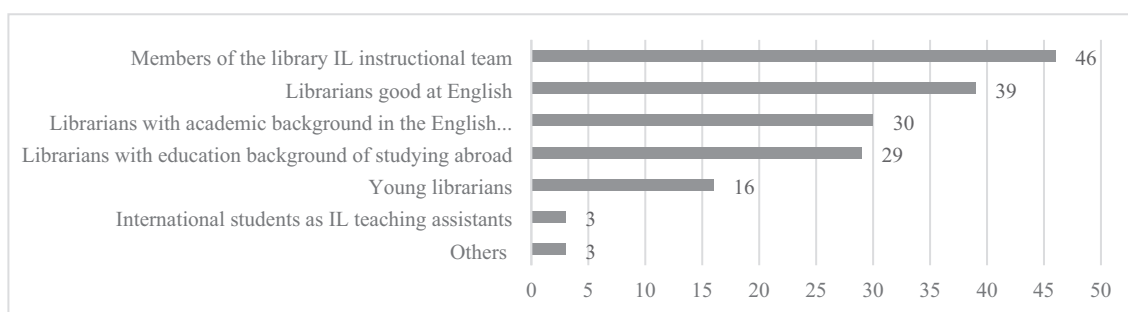


Fig. 2. Composition of the IL instructional team for international students.

teaching assistants or librarians with academic background in medical library and information science. It is shown that IL education for international students in Chinese academic libraries is mainly undertaken by librarians with academic background in foreign languages or overseas studies, members of the library IL instructional team, librarians with good English language skills, etc. Besides, Chinese academic libraries guaranteed the teaching forces by taking full advantage of the related human resources. In addition to the above-mentioned librarians from various sections of the library, they tried to engage external forces such as recruiting international students from the university as IL teaching assistants, and inviting international faculties in relevant departments. In this way, the IL education teaching forces for international students was guaranteed.

#### 12. Teaching methods used in IL education for international students (multiple select)

Among the 76 librarians, 80% (61 people) reported that their libraries used traditional teaching methods in international students' IL classes where students were directed to learn through memorization and recitation techniques, 20% (15) used Rain Classroom, a mobile app and smart teaching tool designed and developed by Tsinghua University, 17% (13) adopted the flipped classroom teaching model, 16% (12) used micro-lectures or micro-videos, and 14% (11) used MOOCs (Massive Open Online Courses), 13% (10) applied other teaching approaches such as problem-oriented teaching, case study, field trips, discussion-based teaching, etc. It is shown that the Chinese academic libraries primarily employed the traditional teaching methods in international students' IL education, while the new teaching methods such as the Rain Classroom teaching tool, flipped classroom teaching model, micro-lectures, MOOCs, etc., were

also applied to match the learning environment and study habits of international students.

#### 13. Main contents of IL education for international students (multiple select)

As shown in Fig. 3, regarding the 76 librarians, all of them introduced their library resources and services and the library resource retrieval method. All the 76 people lectured in web search skills, including searching and using online resources, and the evaluation and utilization of library resources. 38% (29) taught the skills of using scientific research software and tools, 37% (28) introduced academic ethics and norms, 33% (25) taught academic writing and journal article submission, 24% (18) introduced the tools and techniques for keeping academic research up to date, and 1% (1) taught the basics of bibliography. It is shown that what was taught in international students' IL education in Chinese university libraries covered various topics such as methods for resource retrieval, evaluation and utilization, skills for using research tools, academic ethics and norms and so on.

#### 14. Effectiveness of the IL education for international students

Among the 76 librarians, 61% (46 people) said that the IL education for international students in their libraries produced good effects, and 40% (30) said that it was not so effective or was ineffective. This indicates that the IL teaching effect of international students' IL education in 40% of the university libraries was not satisfactory.

#### 15. Main challenges for international students' IL education in Chinese academic libraries (multiple select)

As shown in Fig. 4, among the participants of the survey, 68% (104) pointed out that one of the main challenges they face is the lack of instructional librarians who can teach in foreign

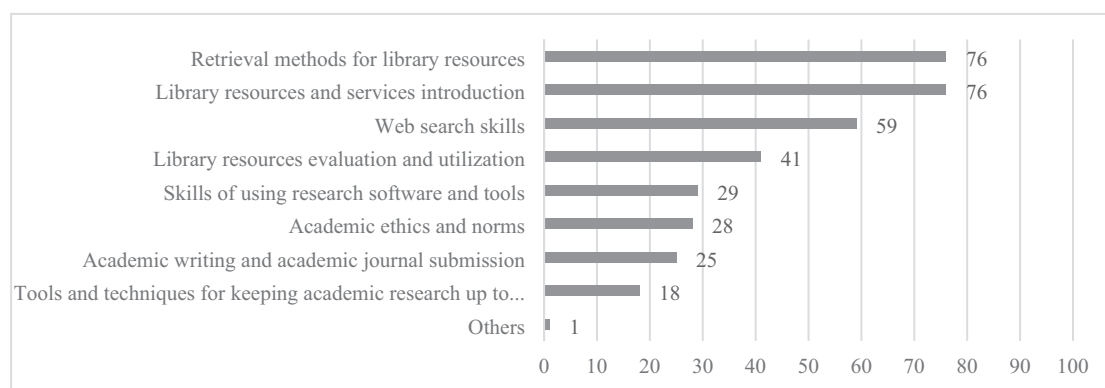


Fig. 3. Main contents of international students' IL education in Chinese academic libraries.

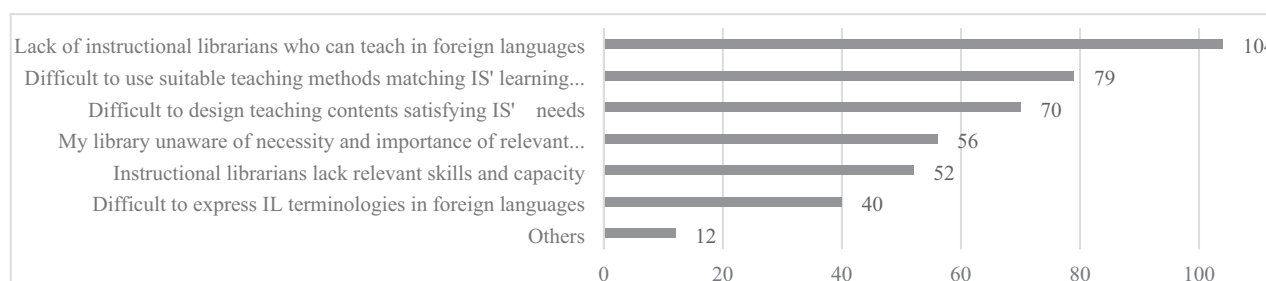


Fig. 4. Challenges for international students' (IS) IL education in Chinese academic libraries.

languages, 52% (79) considered it difficult to apply suitable teaching methods that match the learning habits of international students, 46% (70) said that it was a challenge to design teaching contents that could satisfy international students' IL needs, 37% (56) suggested that their libraries were unaware of the necessity and importance of relevant programs, 34% (52) said that the instructional librarians lacked relevant skills and capacity, 26% (40) said that there were difficulties in expressing the IL terminologies in foreign languages, and 8% (12) mentioned other aspects, such as the international students' lack of awareness and motivation of learning IL skills, or their poor English language proficiency affecting the IL teaching effect. Hence, the lack of teachers capable of instructing in English or other foreign languages, and the teaching methods and content being unadaptable to the trend of internationalization, etc., were the main challenges faced by Chinese university libraries in IL education for international students at the current stage, which became the greatest obstacles for the development of international students' IL education in Chinese academic library.

#### Comparison of questionnaire 1 and 2

By comparing questionnaire 1 and 2, i.e., international students' questionnaire and librarians' questionnaire, the author draws the following conclusion.

##### 1. International students' IL abilities could be further improved.

According to questionnaire 1, most (69%, 24 people) of the surveyed international students never used the library search engines and (63%, 22 people) of them never used library databases to search academic resources. Thus, international students' IL abilities, especially the capabilities to use the library academic resources, could be further improved. Moreover, according to questionnaire 2, 70% (107 people) of the surveyed librarians held that IL ability of international students in their universities were poor, which to a certain degree

revealed that international students' IL abilities were not so good and could be improved. In general, it could be concluded to some extent that international students in Chinese universities need to further improve their IL abilities.

##### 2. International students' IL education and relevant educational event promotion are insufficient.

According to questionnaire 2, the vast majority (97%, 147) of the surveyed librarians held that it was necessary for the libraries to provide IL education for the international students, which demonstrated that the surveyed librarians agreed with necessity of international students' IL education. Besides, according to questionnaire 1, majority (91%, 32) of the international students thought it was necessary for the library to offer them IL training events, despite that most of them seldomly (54%, 19 people) or never (28%, 10 people) took part in the training events. As for 16 surveyed international students who had participated in the events, a large proportion (88%, 14 people) of them recognized benefit of the training, which proved that the training events were generally beneficial for the students. Obviously, for these surveyed international students, they largely recognized the necessity of the training events, but they were probably not provided with or not informed about the events. Thus, IL education for international students and promotion of related educational events are generally not enough.

##### 3. New instructional methods are recommended in IL training events for international students.

According to questionnaire 1, most (80%, 28 people) of the international students love new teaching approaches in library training events. In addition, according to questionnaire 2, the new teaching methods like the Rain Classroom teaching tool, flipped classroom teaching model, micro-lectures, etc., were put into use in IL education for international students at Chinese academic libraries. Therefore, new teaching methodologies are recommended in IL education for international students to raise international students' interest and improve the educational effects.

## Limitations

Despite various results analyzed above, this paper still has some limitations concerning the questionnaire survey result, including that of the librarians' questionnaire and the international students' questionnaire.

### *Limitations of librarians' questionnaire survey result*

One limitation of librarians' questionnaire survey is the not so large result. The author invited librarians in Chinese academic libraries through emails posted in related library websites or WeChat<sup>5</sup> Groups the librarians were in to fill in the questionnaire online by scanning the QR code or clicking the website link created by the Questionnaire Star platform. However, some of the invited librarians were unwilling to fill in or were not interested in the questionnaire, and so they didn't take part in the survey which resulted in the limited results of the questionnaire. In spite of that, as mentioned above, regarding universities the 152 surveyed librarians are from, 35 of them work in First-Class universities which comprise 67% of the domestic First-Class ones, and concerning the location of the universities covered in the survey, the 117 universities are situated in various parts of China, including the eastern, western, northern, southern, and central regions. Therefore, to a large extent, the results of the librarians' questionnaire could be representative of Chinese academic libraries.

Another limitation is that international students' IL abilities were on the basis of librarians' perceptions and were not the students' actual IL. To be specific, librarians' answer to question 1 of the survey, namely, "What do you think of the IL abilities of international students in your university?", was based on their personal feelings rather than objective statistics. This could only to a certain degree show students' IL abilities and therefore limits the claims that could be made about the results of the data analysis of IL education for international students.

### *Limitations of international students' questionnaire survey result*

Similarly, limitation of international students' questionnaire survey also lies in the small result as well as the survey being from a single university in China. Unlike the librarians' questionnaire, it is more difficult to invite the international students to participate in the survey, because it is hard to find their emails, WeChat group they are in, etc., with which the author could contact them. So the author tried the best to invite the international students in Shanghai Jiao Tong University who had taken part in the library IL training or other library events to fill in the students' questionnaire by talking to them face to face or emailing them. As Shanghai Jiao Tong University is one of the First-Class universities in China, to some extent, the international students of this institution could represent those of the country's academic universities.

## Discussion

The results of the questionnaire survey reveal the current situation of international students' information literacy (IL) education in Chinese academic libraries, especially some problems which deserve university librarians' more attention as well as multiple measures taking to promote continuous development of this sort of services in the future.

### *Giving sufficient attention to and strengthening the planning of IL education for international students*

Although Chinese academic libraries recognize the necessity of IL

education for international students, they pay insufficient attention to it. According to the questionnaire survey results, the necessity of IL education for international students is generally recognized by both the surveyed librarians and international students in domestic universities. However, regarding the actual practice, over half (52%) of the academic libraries paid little or no attention to this kind of IL education. As to sources from which librarians know about the international students' IL education needs, only 27% of the surveyed librarians actively contacted the faculty and staff of their universities to know about the students' demand, while most other libraries were passively receiving the requests, such as getting the demand from faculty members' active contacts (35%), receiving requests when visiting faculty or from other sources (33%), etc. What's more, regarding relevant IL educational practice, its various aspects need to be strengthened, including the rate of universities that have carried out IL education for international students, frequency of this kind of IL trainings held by libraries every semester, reach of trainings to schools and departments of the university, and number of students who participated in relevant training sessions. These results suggest that the university librarians' awareness of, attention paid to, and implementation of related IL education are far from enough.

The education of international students and cultivation of competitive global talents play an important role in the internationalization of universities and the "Double First-Class" strategy in China. With teaching support being one of the core tasks, academic libraries are supposed to give sufficient attention to and strengthen the overall planning of IL education for international students so as to back up the school's internationalization and the "Double First-Class" strategy. They should toughen up related planning and design of this specifically targeted IL education from multiple aspects:

1. University libraries should transform IL education for international students from a passive service to an active one. The libraries should alter the current passive service strategy of IL education for international students, from passively waiting for users' service requests to actively contacting relevant departments, publicizing and promoting the IL educational services provided for international students, and thoroughly investigating the relevant educational needs of the students.
2. University libraries ought to identify international students' educational needs in IL. The libraries should initiate a comprehensive study and analysis of international students' demands for IL education, for instance, number of departments concerned, types of students who have relevant needs, training subjects and topics in demand, etc., by all kinds of methods such as contacting faculty, visiting course instructors, carrying out questionnaire surveys and so forth, such that the IL educational services could be carried out smoothly.
3. University libraries should customize IL educational services for international students. The services should be classified into different levels, categories and modules according to international students' educational needs concerning IL. Regarding the category, international students' IL educational services could include freshman training, lecture series on special topics, embedded instruction, credit IL courses, etc. Concerning the module, the training topics could include overview of library resources and services, literature retrieval and utilization, ways to keep up with emerging technologies, skills of using research tools, academic ethics and norms, etc.

### *Expanding the instructional team in charge of international students' IL education*

According to the survey results, the lack of qualified teaching staff was regarded as the biggest challenge for and largest obstacle to the development of IL education for international students. For the most part, foreign students' IL education requires the medium of instruction

<sup>5</sup> As mentioned above, WeChat is a type of communication tool through which one or more persons could participate and send voice messages, pictures, videos and texts via the mobile network.



being Chinese-English bilingual, English or other foreign languages. However, due to the long-term impact of test-oriented education in China, it is common for learners to have strong written test ability but weak oral proficiency in foreign languages. Therefore, conducting IL teaching in foreign languages is still difficult even for librarians who have passed the CET- 4 (College English Test Band 4), CGT- 4 (College German Test Band 4) or other foreign language proficiency tests.

Yet, it is known that teaching staff is the fundamental guarantee for the continuous and further development of IL education for international students. Only when university libraries have enough qualified teaching staff can they provide international students' IL education with basic assurance. Thus, academic libraries should take targeted countermeasures to assure qualified and sufficient teaching staff for foreign students' IL education.

1. The libraries should take full advantage of the potential and role of librarians. They should set up an instructional team that is responsible for the overall organization and coordination of the university's IL education for international students by transferring library staff with a professional background in foreign languages, an educational background of studying abroad, or a good grasp of foreign language fundamentals, etc., to the instructional team.
2. The libraries should give full play to the role of student assistants. They should recruit international or domestic students with good foreign language skills to serve as IL teaching assistants through the work-study programs. By performing duties including translating relevant course materials, running consultation and Q&A sessions, marking assignments and assisting other IL teaching related work, they will provide assistance to IL education for international students.
3. The libraries should stimulate the role of instructors in schools and departments of the university to provide external supports for IL teaching in foreign languages. The library could cooperate with instructors from departments and colleges with an English-language environment, such as joint institutes established by transnational partnerships, schools that admit international students, foreign language departments, etc., to hold lecture series in foreign languages on relevant topics such as application of research software, academic writing, journal submission and so on.
4. University libraries should take advantage of online communication tools such as WeChat, QQ, and Email groups to establish a collaborative platform of IL teaching and learning that supports international students' communication and subject librarians' consultation service.

*Emphasizing teacher-librarians' teaching skill improvement and enhancing new teaching method application to improve the teaching effectiveness*

Generally, the effectiveness of IL education for international students in China's academic libraries is not so satisfying and therefore needs to be improved. According to the survey results, nearly half of the surveyed librarians pointed out that the teaching effect of overseas students' IL education in their libraries was not so good or was bad. The main reasons include the improper teaching methods of the IL education and the insufficient teaching ability of librarians. As the results showed, IL education for international students in Chinese university libraries is mainly based on old teaching methods, while the new ones such as flipped classroom, online teaching, and blended courses are rarely applied although they are appealing to international students. In the meantime, the librarians' proficiency of teaching in foreign languages is limited by their language skills and thereby needs to be enhanced.

Developing all-round instructional skills is fundamental for librarians to teach IL in foreign languages. It is worth academic libraries endeavoring to make the librarians well prepared for international students' IL education so as to improve the instructional effectiveness.

1. Academic libraries should keep upskilling the librarians who offer IL instruction in English or other foreign languages, particularly in foreign-language listening and speaking, because their language proficiency is the foundation stone for the implementation of international students' IL education. Good foreign-language listening and speaking skills underpin the success of IL instruction in foreign languages. On the one hand, librarians teaching in foreign languages should browse and read the university library websites of countries which have English or other related foreign language as their first language to familiarize themselves with the common vocabulary used in the library. On the other hand, they could subscribe to English or other foreign language newspapers or listen to the foreign programs regularly to practice their foreign language reading and listening every day.
2. Teaching librarians should make adequate preparations for the IL teaching in foreign languages. Sufficient preparation for teaching is an important part of carrying out IL education. Before the IL teaching, in addition to analyzing the international students' IL needs and designing relevant course materials, librarians should practice the lectures repeatedly until they become proficient. The librarians who teach in foreign languages for the first time should conduct trial lectures and invite senior librarians to give comments and guidance so that they can improve themselves. Teaching librarians should also anticipate the questions that international students may raise in the class and make relevant preparation.
3. The instructional librarians should carefully design the IL classes for international students. An excellent class design is the key to the success of IL teaching for international students. Teacher-librarians should design the IL class in foreign languages based on full understanding of international students' personalities and needs. For example, international students are relatively more active in class participation than domestic students. In this regard, teacher-librarians should pay enough attention to the design of teacher-student interactions and class discussions, as well as the class exercises and questions that keep students thinking.

Additionally, suitable teaching methods are important means to accomplish teaching objectives and improve teaching effectiveness of IL education for international students. University libraries should pay close attention to modern information technology and communication methods, and make full use of new teaching methods to improve the instruction effectiveness.

1. For first-year student training and other IL related lectures that have a large audience, online teaching methods such as live broadcasting could be employed. Moreover, the lectures in foreign languages could be recorded and made into videos which could be learned repeatedly after class. Thereby the libraries could overcome the limitations of classroom space and lecture time while maximizing the benefits of international students in IL education.
2. For IL workshops or training on specific topics for international students, university libraries could make a series of IL micro-course videos in foreign languages which could be played in several minutes based on a breakdown of the IL teaching units. This form of instruction is convenient for international students to learn anytime and anywhere according to their majors and professional needs, while saving the human resources for IL education in foreign languages.
3. For course-based teaching such as IL courses for international students and embedded IL instruction in foreign languages, the teaching librarians could cooperate with the course instructors to adopt new teaching methods like flipped classroom teaching model, Rain Classroom teaching tools and so on.

In summary, different from the other scholars' previous research which only focuses on one or several universities' practice or partial

components of international students' IL education, the author of this paper examines the advances of this IL educational service in academic libraries in the whole China, analyses the existing problems, and further gives advice for its future development, based on two questionnaire surveys about IL education for international students, namely, international students' questionnaire on their IL education needs and preferences plus librarians' questionnaire on international students' IL education in Chinese academic libraries, aiming to fill in the gap of foreign students' IL education research in university libraries.

## Conclusions

Nowadays, with the continuous advancement of the "Double First-Class" strategy, internationalization has become the basic path to build a world-class university (Lu et al., 2018). The education of international students has also received more attention at the national level. In 2018, the Ministry of Education of China issued the "Higher Education Quality Standards for International Students in China," which emphasizes that domestic universities and colleges should follow the standards to improve the education of international students and promote its sustainable development in China (Ministry of Education of the PRC, 2018). In this context, international students are undoubtedly an essential target group that university libraries should serve, and providing international students with IL education should also be an important part of the library work that should not be overlooked. Up to now, Chinese university libraries have been offering different kinds of IL education for international students, and they have made some achievements concerning the practical exploration of various teaching types and contents, the application of new teaching methods, the diverse medium of instruction, etc. However, there still exist some problems in terms of insufficient attention given to IL education for international students, practice of IL education for international students to be strengthened, serious shortage of teaching librarians qualified in international students' IL instruction, and teaching effectiveness of the IL education for international students to be improved and so forth. In the future, facing the increasingly complex and severe challenges of internationalization of higher education, academic libraries in China as well as in other parts of the world are advised to continuously improve IL education for international students from such aspects as strengthening the planning and design of IL education for international students, expanding the instructional team in charge of international students' IL education, emphasizing the improvement of IL teaching skills of teacher-librarians, and enhancing the application of new teaching methods in IL education, aiming at supporting the international student education and boosting the higher education internationalization of the universities.

## CRedit authorship contribution statement

I have made substantial contributions to the conception and design of the work, and acquisition, analysis, and interpretation of the data of the work. I have drafted the work and revised it. I approved the final version to be published. I agree to be accountable for all aspects of the work in ensuring that questions related to the accuracy or integrity of any part of the work are appropriately investigated and resolved.

All persons who have made substantial contributions to the work reported in the manuscript, including those who provided editing and writing assistance but who are not authors, are named in Acknowledgements section of the manuscript.

## Declaration of competing interest

Qinling Huang's research interests include information literacy instruction, information retrieval, information consultation, and collection development. She has published a number of academic papers in journals. She is one of the librarians who are responsible for information literacy education for international students in Shanghai Jiao Tong

University Library.

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## Appendix A. Survey on library information literacy education for international students

In order to know about international students' information literacy preferences and needs, and offer better information literacy education services for you, we designed this questionnaire survey. The data will only be used as reference for librarians' study on international students' information literacy. Our sincere gratitude to your support of the library work!

1. 1 How do you search the academic resources? (Multiple select)
  - Through the free search engines, e.g., Google
  - Through the scholarly literature search engines, e.g., Google Scholar
  - Through the library search engines, e.g., OURExplore
  - Through the library databases
  - Haven't searched the academic resources yet
2. Have you ever taken part in library information literacy training events?
  - Yes and often
  - Yes and several times
  - Yes but few
  - No
3. Do you think it is necessary for the library to offer information literacy training events for international students?
  - Quite necessary
  - Necessary
  - Not so necessary
  - Not necessary
4. What instructional methods would you like the librarians to use in the information literacy training events? (Multiple select)
  - Just traditional instruction methods, i.e., teachers teach and students listen
  - Librarians offer the instruction materials to the students before class, and then there are more discussion and exercises in class
  - Librarians post the instruction videos online, and then the students study the videos online
  - Other instruction methods, like \_\_\_\_\_
5. 5 Generally, do you think the library training event is beneficial to you?
  - Very beneficial
  - Beneficial
  - A little beneficial
  - Not beneficial
  - I don't know, because I haven't taken part in any library training event.

## Appendix B. Survey on IL education for international students in Chinese academic libraries

Due to the needs of the project, we specially designed the questionnaire survey targeted at university librarians on information literacy education for foreign students in Chinese academic libraries. Thank you for your strong support.

Your library \_\_\_\_\_ [Fill in the blank].

The main work you are involved in or are responsible for (such as liaison, information literacy education, collection development,

information analysis, etc.):

\_\_\_\_\_ [Fill in the blank].

1. What do you think of the IL abilities of international students in your university?
  - Very good
  - Good
  - Not so good
  - Bad
2. Do you think it is necessary to carry out IL education for international students?
  - Very necessary
  - Necessary
  - Not so necessary
  - Unnecessary
3. Do you think your library attaches importance to IL education for international students?
  - Yes, I think the great importance is attached.
  - Yes, I think the importance is attached.
  - No, I think little importance is attached.
  - No, I don't think so.
4. What are the sources from which librarians know about the international students' IL education needs? (Multiple select)
  - Faculty members from various departments take the initiative to contact librarians about the international students' IL education needs.
  - Librarians actively contact faculty and staff from different departments of the university
  - Librarians receive requests when visiting faculty members
  - Others, such as \_\_\_\_\_
  - International students in my university has no IL training needs.
5. Has your library carried out IL education for international students in the university?
  - Yes.
  - No.
  - My library is planning IL education for international students.
6. What is the frequency of IL instruction sessions targeted for international students in your library?
  - Over 10 sessions every semester
  - 6–9 sessions every semester
  - 2–5 sessions every semester
  - Less than 2 sessions every semester
  - My library hasn't offered IL education for international students.
7. How many departments whose international students participated in the IL educational events offered by the library are there in your university?
  - Over 7 departments
  - 5 to 6 departments
  - 3 to 4 departments
  - 1 to 2 departments
  - My library hasn't offered IL education for international students.
8. How many participants are there in the international students' IL education events offered by your library each year? (including domestic students simultaneously participating in the training sessions)
  - Over 200 participants
  - 100 to 199 participants
  - 50 to 99 participants
  - Less than 50 participants
  - My library hasn't offered the events.
9. What are the types of IL education for international students in your library? (Multiple select)
  - Trainings for first-year international students
  - Training series on specific topics for international students
  - Embedded IL instruction in various courses for international students
  - IL courses for international students (including elective courses instructed in Chinese open to all domestic and international students)
  - Others, such as \_\_\_\_\_
  - My library hasn't offered IL education for international students.
10. What languages do librarians use in international students' IL instruction in your library?
  - English
  - Both Chinese and English
  - Chinese
  - Others, such as \_\_\_\_\_
  - My library hasn't offered IL education for international students.
11. What is the IL instructional team for international students in your library composed of? (Multiple select)
  - Librarians with academic background in the English language
  - Librarians with education background of studying abroad
  - Librarians good at English
  - Young librarians
  - Members of the library IL instructional team
  - International students as IL teaching assistants
  - Others, such as \_\_\_\_\_
  - My library hasn't offered IL education for international students.
12. What teaching methods does your library usually use to carry out IL instruction for international students? (Multiple select)
  - Traditional teaching methods with which students were directed to learn through memorization and recitation techniques
  - Flipped classroom teaching model
  - Rain Classroom
  - Micro-lectures
  - Micro-videos
  - MOOCs (Massive Open Online Courses)
  - Others, such as \_\_\_\_\_
  - My library hasn't offered IL education for international students.
13. What are the main contents of IL education for international students in your library? (Multiple-select)
  - Library resources and services introduction
  - Retrieval methods for library resources
  - Web search skills
  - Library resources evaluation and utilization
  - Skills of using research software and tools
  - Academic ethics and norms
  - Academic writing and academic journal submission
  - Tools and techniques for keeping academic research up to date
  - Others, such as \_\_\_\_\_
14. How effective do you think the IL education for international students is in your library?
  - Very effective
  - Effective
  - Not so effective
  - Ineffective
  - My library hasn't offered IL education for international students.
15. What do you think are the main challenges in carrying out IL education for international students in Chinese academic libraries? (Multiple select).
  - Lack of instructional librarians who can teach in foreign languages

- Instructional librarians lack relevant skills and capacity
- My library unaware of the necessity and importance of relevant programs
- Difficult to design teaching contents satisfying international students' needs
- Difficult to use suitable teaching methods matching international students' learning habits
- Difficult to express IL terminologies in foreign languages
- Others, such as \_\_\_\_\_

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