

Delphi Research on Information Literacy Competency Standards for Higher Education in Beijing, China

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ABSTRACT: This article is a progress report on a project to develop Information Literacy Competency Standards for Higher Education in Beijing, the capital of China, using Delphi method. The Standards was approved by the Institute of Beijing Academic Libraries in 2005 and became the first formal information literacy competency standards for higher education in China.

I. Introduction

The term “information literacy” was introduced to China in mid-1990s. At that time, academic library user education in China, whose approach was mainly the credit course “Literature Retrieval” was in downturn. The teaching librarians were thinking about how to reform user education to adapt the new network environment and attract more students. The concept of information literacy illumined the librarians and evoked related researches and discussions (Pi, 2003). Information literacy has gradually been a hot research topic in the library circles, especially in academic libraries. Information literacy education in academic libraries is considered not only an expansion and promotion of user education but also a new foothold and direction of the academic libraries in a network environment (Yu & Shan, 2004, pp. 115-8).

China’s academic libraries have achieved some progress in information literacy education, which can be illustrated in several distinctive aspects. First of all, teaching goals and content as well as evaluation methods of the traditional credit course “Literature Retrieval” have been transformed so extensively that the name of the course has been changed to “Information Retrieval” in many academic libraries. Second, many academic libraries begin to provide various workshops. Third, many

academic libraries have built their electronic classrooms for hands-on instruction in the use of the electronic resources. Finally, more and more academic libraries begin to provide online guides, online tutorials and online courses (Wu, 2003, pp. 106-8).

In China, it has been widely recognized that information literacy competency standards for higher education appropriate for China's situation is very necessary in order to promote information literacy instruction and assessment in academic libraries. Information literacy competency standards are considered to be the objective of information literacy instruction, the basis of information literacy assessment, and the foundation of the establishment of information literacy education system (Sun, Jianjun, 2001, p. 25-6). Thus the Institute of Beijing Academic Libraries (IBAL) entrusted its division, Association of Information Literacy for Higher Education of Beijing (AILHEB), to develop Beijing's Information Literacy Competency Standards for Higher Education in May 2003.

Beijing is an ancient capital city with a long history of 3000 years. There are 66 regular higher education institutions in Beijing, accounting for about 10% of the country's total. Moreover, there are many large, famous universities among them, such as Tsinghua University, Peking University, and People's University of China. Beijing's academic libraries precede other academic libraries in information literacy education in China and play a leading role. IBAL hopes that academic libraries all over the country will be led to use Beijing's Information Literacy Competency Standards for Higher Education developed and adopted by Beijing's academic libraries.

The members of the project team come from Tsinghua University Library and Library of Beijing University of Aeroacoustics & Astronautics. Beijing's Information Literacy Competency Standards for Higher Education was drafted in June 2005 and approved by IBLA in October 2005.

II. Research Goal

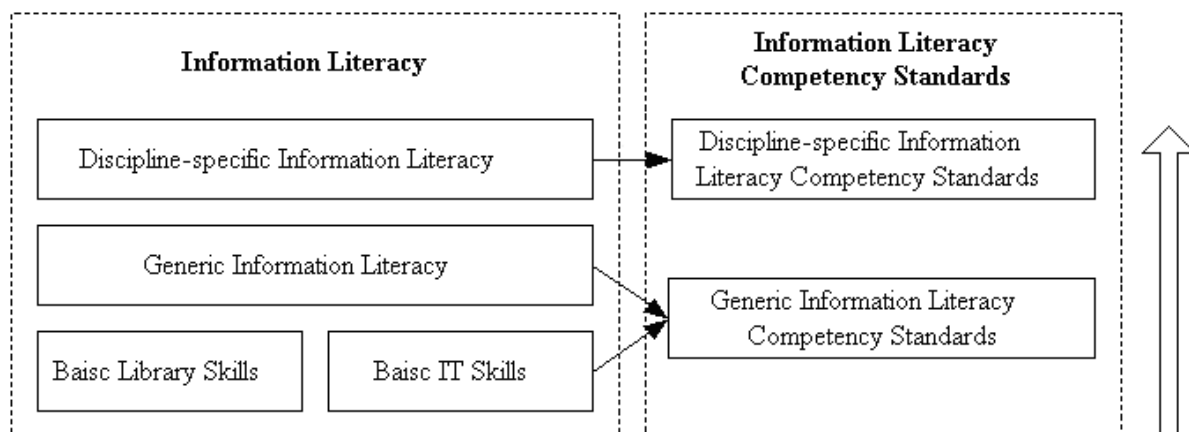
The information literacy competency for higher education is divided into three levels from low to high on the basis of literature review and analysis by the project team. The first level is basic information literacy competency, which consists of basic library skills and basic IT skills. The second level is generic information literacy competency, which is a set of skills that apply to the process of information retrieval, evaluation and use across academic disciplines and, additionally, to addressing the information needs of daily life. The third level is discipline-specific information literacy competency, which are information literacy skills that are embedded within the research paradigms and procedures of certain disciplines. These three levels of the information literacy competency are consecutive in sequence. Mastering the lower level competency is the basis for the study of a higher level competency (Grafstein, 2002, pp. 197-204).

The project team believes that academic libraries should help students to master different levels of information literacy according to students' advancement in academic years. Freshmen and sophomores need to master basic information literacy competency, juniors and seniors need to master generic information literacy competency as well as basic discipline-specific information literacy competency, and graduate students need to master discipline-specific information literacy competency.

According to the levels of the information literacy competency, the information literacy competency standards for higher education are divided into two levels (shown in figure 1). The first level is generic information literacy competency standards, which describe the outcomes of the basic and generic information literacy competency. The second level is discipline-specific information literacy competency standards, which describe the outcomes of the specific information literacy competency required in different disciplines. The discipline-specific information literacy competency standards are the expansion and extension of the generic information literacy competency standards in different disciplines.

The goal of the project is to design the generic information literacy competency standards for higher education in Beijing.

Figure 1: levels of information literacy competency standards for higher education



III. Research Design

The development of most standards can be divided into four phases. So are the information literacy competency standards for higher education. The main tasks in each phase are as follows:

- Phase I (Drafting): The project team produces the Draft Standards based on literature review and analysis.
- Phase II (Consensus-Building): The project team seeks feedbacks from experts in information literacy education field and modifies the Draft Standards accordingly until the Draft Standards are accepted widely by the experts.

- Phase III (Maintenance): The project team revises the formal Standards through the feedback during a trial period.
- Phase IV (Review): The project team either adds or deletes indicators of the formal Standards according to new situations and preserves indicators that do not need changes (Teng, 2003, pp. 5-11).

The main tasks in Phase I and Phase II were completed in June 2005, namely, Drafting and Consensus-Building. The main tasks in Phase III and Phase IV are in progress.

Phase I: Drafting

The project team analyzed literatures in China and abroad that is related to information literacy in higher education and laid more emphasis on the following.

First, the project team focused more on literature on information literacy education pertinent to China's situation. Haiqun Ma came up with his definition of information literacy: "information literacy should include information wisdom, information moral, information consciousness, information conception, information potential and information psychology"(Ma, 1997, p. 95). Many scholars discussed and further developed Ma's definition. It is now widely held in China that information literacy encompasses information consciousness, information knowledge, information ability and information moral (Wang, 2002, pp. 37-42).

In addition, the project team investigated the current status of information literacy education in academic libraries in Beijing. A variety of approaches have been identified, including freshmen orientation, special topic workshops, credit courses and online information literacy instruction. Special topic workshops are mainly about how to use diverse e-resources in the library and how to search for different type of documents, such as dissertations. More than 80% of academic libraries in Beijing offer credit courses on information literacy. Credit courses cover such subjects as "Using the modern library", "Using reference books", and "Information (Literature) retrieval". These are taught at different levels and have different requirements. The main purpose of the credit courses is to teach students information access technology, focusing on the searching methodology and computer applications. Some courses for graduate students on information and document preparation are taught to prepare them for their thesis work, for example, "Information gathering and synthesizing for special academic research topics", "Information access principles and technology", and "Information resource management" (Sun, Ping, 2002, pp. 210-9).

Meanwhile, the project team analyzed documents on user education in academic libraries,. Information literacy education has developed on the basis of user education in China. And user education developed rapidly due to the support of the educational authorities from 1984 to 1995, which is called "user education vigor period". The

following documents about user education in academic libraries were enacted by China's educational authorities:

- Chinese Ministry of Education issued a document in December 1984, entitled *Suggestions on the Course of Literature Retrieval in the Universities*.
- Chinese State Education Commission issued a document named *Suggestion on Improving the Course of Literature Retrieval* in September 1985 and a document named *Basic claims on the Course of Literature Retrieval* in May 1992.
- Chinese State Education Commission published two books in 1995. One is *Teaching Syllabus for the Course of Social Science Literature Retrieval*, and the other is *Teaching Syllabus for the Course of Science and Technology Literature Retrieval*.

All the documents were about the course "Literature Retrieval" because the credit course was the main approach of user education in years past. Since 1996, delegating authority to the universities, the educational authorities have no longer issued the documents for user education and information literacy education. The above documents specify the teaching goals of the credit course "Literature Retrieval" as follows:

- Students know the principle, characteristics and methods of literature retrieval;
- Students know the types of retrieval device and searching methodology;
- Students are familiar with the contents and using method of retrieval devices in common use;
- Students can use retrieval devices to accomplish a specific purpose (Yang, 1999, pp. 32-4).

These documents list the teaching syllabus of the course "Literature Retrieval". Some of the contents of the documents are outdated. However, other contents are still guidance to information literacy education because "Literature (Information) Retrieval Course" is an important approach of information literacy education in academic libraries.

Finally, the project team analyzed information literacy standards for higher education abroad, for example, *Information Literacy Competency Standards for Higher Education* by Association of College and Research Libraries (ACRL, 2000), *Australian and New Zealand Information Literacy Framework* by Australian and New Zealand Institute for Information Literacy (ANZIIL, 2003), *Information Skills Model* by the Standing Conference of National and University Libraries (SCONUL, 2003), and *Model of Information Literacy Person* by British Big Blue Project (MMUL, 2002).

The project team produced the Draft Standards on the base of above study. The Draft Standards reflect information literacy in four aspects: information consciousness,

information knowledge, information ability, and information moral. Of these, “information ability” is defined as a set of skills needed to retrieve, analyze, communicate and use information and to use information system.

The framework of the Draft Standards looks like a tree, including three-level indicators. There are 7 first-level indicators named as *Standard*, 22 second-level indicators named as *Performance Indicator*, and 75 third-level indicators named as *Outcome*. Some indicators are derived from ACRL’s Information Literacy Competency Standards for Higher Education, but the concepts and text have been adapted and updated to incorporate recent local understandings of information literacy education.

Phase II: Consensus-Building

Methodology

The Delphi method was used in Phase II. This research approach was developed at the Rand Corporation by Helmer, Dalkey, and Rescher in 1950s and has been applied in library science research since 1970s. The Delphi method is a technique of obtaining the most reliable consensus of opinions from a group of experts through a series of questionnaires. The main steps of the Delphi method are:

1. Selection of one panel to participate in the study. Customarily, the panelists are experts in the area to be investigated.
2. Development of the first round Delphi questionnaire and transmission of the first questionnaires to the panelists.
3. Analysis of the first round responses.
4. Preparation of the second round questionnaires.
5. Transmission of the second round questionnaires to the panelists, inclosing with the analysis results of the first round response.
6. Analysis of the second round responses (Steps 4 to 6 are reiterated as long as obtaining consensus of opinion among experts.)
7. Preparation of a final report to present the conclusions of the study.

The project team chose the Delphi method mainly because it has following advantages over other consensus building methods:

1. Authenticity. The panelists are polled individually and anonymously, which assures that equal weight is given to all participants, so they can express their opinions equally and freely without any pressure.
2. Interaction. The Delphi method consists of a series of questionnaires, of which the second and subsequent rounds feedback information to the participants while giving them the chance to rethink and, if necessary, to restate their opinions in light of the feedback from the entire panel.

3. Statistics. Certain statistic methods are used in data analysis and to decide whether the consensus is achieved.
4. Authority. The final results come from consensus built by a group of experts. So they may be easier to accept by other persons (Helmer, Dalkey, & Rescher, 1959).

Participants

According to the principles of Delphi method, the number range of Delphi panelists is from 10 to 15, if the panelists needed are homogeneous. The project team invited thirteen experts in information literacy education to form the panel and received their confirmation through telephone or email.

Thirteen experts come from thirteen different university libraries in Beijing. They have all been engaged in user education for many years, which is considered as the precursor of information literacy education in China. They are current information literacy instructors in their libraries and most of them are responsible for the development of information literacy education of their own libraries. They have both theory and practice in information literacy education. They are also members of Executive Committee of AILHEB. Naturally, they are enthusiastic about the research project.

Devise questionnaire

There are five questions in the questionnaire.

- Question 1: Please evaluate the importance of each *Performance Indicator*. Experts were asked to rate their level of evaluation according to a four-point Likert-type scale (1=Not important, can be deleted, 2=Limited important, can be combined with other *Performance Indicators*, 3=Important, 4=Essential).
- Question 2: Please evaluate whether each *Performance Indicator* and its *Outcomes* are described clearly. Experts were asked to rate their level of evaluation according to a four-point Likert-type scale (1=Very unclear, 2=Somewhat unclear, 3=Somewhat clear, 4=Very clear).
- Question 3: Please give your advice on each *Performance Indicator* and its *Outcomes*.
- Question 4: Please write down the *Standards* and *Performance Indicators* not covered in the Draft Standards.
- Question 5: Please give your advice on the whole Draft Standards.

Treatment of Data

Quartile deviation (Q.D.) and “overwhelming opinion” are used in treatment of data of Question 1: Please evaluate the importance of each *Performance Indicator*.

“Overwhelming opinion” points to the option that is chosen by most experts. Take the evaluation data of the importance of *Performance Indicator 2.3* for example. If 7.7% experts choose option 1, 15.4% experts choose option 2, 30.8% experts choose option 3, 46.2% experts choose option 4, then the “overwhelming opinion” of importance of *Performance Indicator 2.3* is option 4 (essential).

When a *Performance Indicator* has more than one “overwhelming opinion” it indicates that the experts’ opinions are dispersive. So the project team will modify the *Performance Indicator* on the experts’ advice gathered through the questionnaire and asked the experts to evaluate the importance of the *Performance Indicator* in the subsequent round.

When a *Performance Indicator* has only one “overwhelming opinion” Q.D. decides whether the “overwhelming opinion” is consensus of the experts. On the base of statistical analysis, the project team decided that the “overwhelming opinion” is consensus of the experts when Q.D. ≤ 0.5 and that when Q.D. > 0.5 , the “overwhelming opinion” is not experts’ consensus. So the project team will modify the *Performance Indicator* on the expert’s advice and ask the experts to evaluate the importance of the *Performance Indicator* in the subsequence round.

Average (\bar{x}) is used in treatment of data of Question 2: Please evaluate whether each *Performance Indicator* and its *Outcomes* are described clearly. When $\bar{x} > 3.5$, the project team think that the descriptions of the *Performance Indicator* and its *Outcomes* reach the desirability.

Procedures

A two-round Delphi process was utilized to achieve consensus among experts. All the experts returned their questionnaires via email on schedule in the two rounds. So the questionnaire response rate was 100%.

First Delphi Round

A packet for the first Delphi round was emailed to each expert on the panel. The packet included the Draft Standards, the first round questionnaire and a brief explanation of the Delphi method.

The responds of the first Delphi round are as follows:

- All the experts agreed on the tree-framework of the Draft Standards and seven Standards.
- Experts thought that the content of the Draft Standards was comprehensive enough. So they did not add any new Standards or *Performance Indicators*.
- One of twenty-two *Performance Indicators* in Draft Standards had two “overwhelming opinion” and the others had one “overwhelming opinion”

Fourteen *Performance Indicators* which had one “overwhelming opinion” were considered essential, and the importance of the other seven *Performance Indicators* did not achieve consensus.

- The descriptions of only five essential *Performance Indicators* were considered very clearly and \bar{x} was just beyond 3.5, which indicated the descriptions of the Draft Standards was unsatisfactory.
- Experts gave a great deal of advice on the descriptions of each *Performance Indicator* and their *Outcomes*.

The project team revised the Draft Standards according to the responses of the first Delphi round and put forward the second edition of the Standards. In the second edition of the Standards, the number of the *Performance Indicators* was decreased from twenty-two to twenty as certain *Performance Indicators* were either combined or deleted, and the descriptions of each *Performance Indicator* and their *Outcomes* were modified because \bar{x} was low.

Second Delphi Round

A packet for the second Delphi round was emailed to each expert on the panel. The packet included the second edition of the Standards, the second round questionnaire, and the analysis report of the first Delphi round which included “overwhelming opinion? Q.D. and \bar{x} of each *Performance Indicator* as well as the collection of the experts’ advice.

The responses of the second Delphi round are as follows:

- There are twenty *Performance Indicators* in the second edition of the Standards, 14 of which were considered essential in the first round while in the second round, 5 were considered essential and 1 was considered to be removed.
- The descriptions of 19 essential *Performance Indicators* and their *Outcomes* were considered very clearly and \bar{x} of most *Performance Indicators* were even beyond 3.7.
- Experts considered that the description of the second edition of the Standards was more compendious and clear than the Draft Standards, and had greater maneuverability.
- Experts gave advices on descriptions of several *Outcomes*.

The project team revised the second edition of the Standards according to the experts’ advice and produced the final version of the Standards.

IV. Conclusion

The final version of the Information Literacy Competency Standards for Higher Education in Beijing consists of seven first-level indicators (*Standard*), nineteen

second-level indicators (*Performance Indicator*) and sixty-one third-level indicators (*Outcome*).

Seven first-level indicators are as follows:

- Standard 1: The information-literate student knows the importance and effect of the information and information literacy.
- Standard 2: The information-literate student determines the nature and extent of the information needed.
- Standard 3: The information-literate student accesses needed information effectively and efficiently.
- Standard 4: The information-literate student evaluates information and its sources critically and incorporates selected information into his or her knowledge base to construct new knowledge.
- Standard 5: The information-literate student manages, organizes and communicates the information effectively.
- Standard 6: The information-literate student, individually or as a member of a group, uses information effectively to accomplish a specific purpose.
- Standard 7: The information-literate student understands many of the economic, legal, and social issues surrounding the use of information and accesses and uses information ethically and legally.

Compared with information literacy standards for higher education abroad, a distinctive feature of Beijing's Information Literacy Competency Standards for Higher Education is its emphasis on information consciousness besides information knowledge, information ability and information moral. China is a developing country. Information resources, computers and internet are scarce in poor areas. In addition, a lot of elementary and secondary schools do not devote any school time to information literacy education, which is typical of an exam-oriented education. So many high school graduates are lack of information consciousness.

Standard 1 is about information consciousness.

Table 1: Standard One

Standard One

The information-literate student knows the importance and effect of the information and information literacy.

Performance Indicators:

1.1 The information literate student owns strong information consciousness.

Outcomes include:

- a Knows what is information
- b Knows that information makes great effect on study, research and life.
- c Knows that gaining information is one of the important solutions to problems.

1.2 The information-literate student knows what is information literacy.

Outcomes include:

- a Knows that information literacy is a set of skills, including finding, retrieving, analyzing, and using information.
- b Knows that information literacy is the foundation of research.
- c Knows that information literacy is an important ability for a lifelong learner.

The final version of Beijing's Information Literacy Competency Standards for Higher Education was approved by IBLA in October 2005 and became the first information literacy competency standards for higher education in China. The further tasks of the project team are to collect the feedback from academic libraries and revise the Standards accordingly.

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