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Innovation Mode and Evaluation System of Embedded Information Literacy Education in Colleges and Universities

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ABSTRACT

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The combination of modern information technology and Internet media technology has led to the reform in information literacy education. In order to better integrate the disciplining service model in library and information resources carriers into the teaching and scientific research process in academic universities, this essay conducts an analysis on the information literacy education model from perspectives of knowledge transformation and knowledge spiral to optimizing the information literacy environment. Considering the demands of constructing information awareness, coping with information analysis and improving information skills, this essay proposes a staged embedded teaching service model based on users' demands. It also proposes the implementation paths and improvement strategies for information literacy education in the background of Internet pus.

1. Introduction

In September 2014, United Nations Educational, Scientific and Cultural Organization (UNESCO) laid emphasis on the role of universities and mass media in contributing to multicultural cooperative research on public Media and Information Literacy (MIL). With the widespread application of cloud computing and big data in the education field, information literacy education needs to make instant and primary transition. As a new educational model integrating process and emphasizing problems, embedded information literacy education is put forward to promote and expand the content and methods of information literacy education.

2. Analysis and evaluation on the development of embedded information literacy education in universities in China and foreign countries

Embedded information literacy education courses have not been widely offered by universities and colleges in China, and the course of literature retrieval still acts as the main way of delivering information literacy education. In response to the information demands of discipline teams and high level users, embedded information literacy education service in China makes use of information media to provide in-depth services, namely embedding information literacy education and training into specialty courses and fields. As for the information literacy education in foreign countries, it is guided by the teaching goal in the form of face-to-face teaching or Internet platform teaching with the help of online platforms such as Blackboard or WebCT. Subject librarians will provide assistance for teachers in designing the teaching model by conducting widespread cooperation with them and emphasizing the evaluation on the effectiveness of teaching. The limitation of information literacy education is the lack of various teaching forms and models, which makes it impossible to penetrate into professional subject field and embed into the teaching process of specialty courses. It is considered to pose obstacles on the development of information literacy education. As a result, one effective way of contributing to the informatization process of education is to lay more emphasis on the teaching and assimilation of knowledge, reorganize the process of information literacy education and strengthen students' information awareness and their ability of gaining and utilizing literature information, thus realizing the persistent radiation effect of literacy education. The concept of embedded information literacy education is originated from the teaching principle put forward by American P. B. Knapp, who proposed the teaching method that would be completed by the coordination and cooperation between librarians and teachers to provide education for library users.

In fact, information literacy education should not be separated from the professional teaching system but be integrated into the whole teaching process as a new teaching service model. Embedded information literacy education requires the active participation of subject librarians into the teaching and research field of certain subject, and it also requires the close cooperation between teachers, students and subject librarians by combining the teaching and research ability of professional knowledge and the practice of information ability. By informing students of the information distribution of academic resources and basic processes of information identification and information retrieval in the class, their information literacy in terms of information retrieval, utilization and evaluation will be improved through case study and exercises.

3 Innovation design of development model of embedded information literacy education

3.1 Framework design for the development model of embedded information literacy education By analyzing on the model of information literacy education, it is suggested that the information literacy environment should be optimized from perspectives of knowledge transition and knowledge spiral while the comprehensive information literacy ability of students should be improved by cultivating their information awareness, literacy ability and information innovation ability. In addition, with the application of digital information technologies such as mobile technology and new-media in information literacy education at different stages, it is possible to transfer the focus of education from resource investment to utilization. By strengthening the communication of demands and laying emphasis on feedback effectiveness, the information literacy education could be conducted online, intelligently and ubiquitously. Figure 1 presents the framework for the development model of embedded information literacy education.

Figure1 Framework design for the development model of embedded information literacy education

3.2 Analysis on the development model of embedded information literacy education

The process of knowledge transformation is characteristic of spiral uprising and constant innovation. The level diversification feature of information literacy education could meet the evolutionary development requirements of knowledge teaching and assimilation. The goal of information literacy education could not be accomplished at one stroke. On the contrary, it should be adjusted according to the settlement of training programs for university students at different stages and levels with different major backgrounds. In addition, it should also be integrated into the whole study process including public elementary courses, specialty theoretical courses, innovative practice courses and graduation thesis or design. Benefited from the study method of combining knowledge with behavior, the information awareness, literacy ability and information innovation ability of students could be comprehensively cultivated. In fact, different information literacy education should be designed for different study stages to gain a better understanding of information demands and explore various information service models.

3.3 Preliminary stage —stage of arousing and cultivating information awareness

The preliminary stage is designed for freshmen in universities who are characteristic of less awareness of information literacy by providing them with preliminary information literacy education. The major purpose of this stage is to lay more emphasis on the importance of information and the understanding of information value. At this stage, it is necessary for librarians to communicate with teachers in terms of the teaching syllabus, plan, features of the major and the professional qualities of students to design literature information retrieval practice related to professional knowledge. Only in this way could it possible to arouse the potential demands of students for professional information and cultivate their information retrieval awareness of habits. At the preliminary stage, the professionalism literacy and background of librarians and the communication efficiency of teachers act as the main driven forces for the development of embedded information literacy education.

3.4 Intermediate stage — stage of analyzing and process of information

The intermediate stage is designed for sophomore and junior students. On the basis of public elementary courses, specialty theoretical courses and innovative practice courses, students are able to gain an overall understanding of the major, which inspires their demands for digital information resources. By conducting a lateral cooperation program with teachers, it is possible for librarians to actively participate into the study activities in class, design of projects and inform them of the whole process involving information distribution, information identification, information analysis and information retrieval. With the help of case study and homework trainings, librarians will introduce relevant skills to students including information literature retrieval, utilization and evaluation, so as to inform them of common methods that could gain access to original literature. At this stage, the disciplinary background, knowledge structure as well as professional abilities in providing database training of librarians act as the driven forces for the promotion and application of embedded informational literacy education at the intermediate stage.

3.5 Advanced stage — stage of improving information skills and innovation ability

The advanced stage is designed for senior graduates, whose main task is to deal with the most important comprehensive practice session in the undergraduate curriculum system, namely the graduation design. The professional information literacy ability of students will pose a profound and continuous impact on the whole graduate design process including the topic selection of dissertation, literature review, formulation of technical route and scheme, thesis writing as well as the graduation design phase, during which the retrieval and utilization of professional literature information play an indispensable role. At this stage, by establishing an effective communication system between librarians, teachers and students, librarians are able to explore the in-depth information demands of teachers and students under certain professional background in selecting and analyzing literature information. Benefited from the communication system, students might make improvements in analyzing retrieved topics and formulating retrieval strategies by flexibly selecting and exploring professional database, search engine and Open Access academic resources. Moreover, their information morality and information security

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4 Implementation approaches and improvement strategies of information literacy education in the background of "Internet plus"

The increasingly widespread application of information technology in the education field has contributed to the diversified concepts of information literacy. According to the definition of information literacy published by ACRL, information literacy includes various professional skills such as data literacy, media literacy as well as visual literacy, which are known as indispensable skills in the 21st century. As a result, the teaching methods and techniques of information literacy should follow the trend of intelligent and ubiquitous.

4.1 Establishment of navigation website and test system on knowledge library for freshmen

The traditional library access education for freshmen is always conducted in the form of delivering introduction speeches or collective visiting, most of which fail to reach the original effectiveness. In fact, considering the practical information demands of freshmen, it would be more effective to provide navigation website and instruction manual for

for freshmen is always conducted in the form of delivering introduction speeches or collective visiting, most of which fail to reach the original effectiveness. In fact, considering the practical information demands of freshmen, it would be more effective to provide navigation website and instruction manual for freshmen by making use of advanced information technologies. In this way, students are able to gain a better understanding of the basic services as well as rules and regulations of the library. In addition, the presentation of visual library in library access videos and micro-films will effectively inform students of the service information of library including the layout of collection, reading and lending model, arrangement rule of books and the operation timetable of library. As a result, students' information demand awareness will be strengthened under the information service environment and their autonomous learning ability will be improved. As for the online test system of library access education for freshmen, both multiple-choice questions and game model could be adopted to examine the study performance of freshmen in library access education. And their access to lending book could only be gained after they pass the online test for library access education instead of authorized manually by librarians.

4.2 Intelligent cooperation with teachers and students and provision of embedded teaching service driven by demands

The widespread provision of information services has contributed to the transformation of embedded information literacy education from driven by information technology to driven by users' demands. Librarians are expected to take up the responsibility as information literacy trainers to cooperate with teachers in exploring teaching models, delivering courses, constructing embedded teaching service models at different stages as well as exploring potential value of study results based on the textbooks and reference books. For instance, with the help of in-depth communication between teachers and librarians, they could integrate the teaching syllabus, teaching programs, features of majors and the professional literacy of students to embed the information literacy education of library into the teaching process of professional course, thus cultivating their information retrieval techniques and habits of utilizing library resources. Teachers of professional courses will spare 2 class hours for librarians to deliver relevant information literacy courses based on the teaching syllabus and course distribution, thus informing students of the basic process of professional academic information distribution, information identification and information retrieval. With the help of case study and task training, librarians would introduce relevant skills and techniques of information retrieval, utilization and evaluation to students. After class, by establishing an effective communication system between librarians, teachers and students, it is possible to further explore the in-depth demands for embedded teaching service model of students and teachers. In the form of virtual reference service and real-time reference service, students' information obtaining and knowledge mining ability will be improved to a large extent. In order to meet the demands of senior graduates, the embedded teaching model should provide guidance on the selection of graduate design, research of topic and thesis writing. In the topic selection phase, it should focus on improving the awareness of professional information and inspiring the creativity and feasibility of research topic. By exploring the research background and frontiers of the discipline, librarians should provide in-depth service for users in adaption to the collection of research interest and related knowledge retrieval from the perspective of professional information literacy and sustainable development of the discipline, thus constantly improving the discipline service ability of librarians. Specifically speaking, librarians could provide detailed introduction to Chinese database, foreign language database and Open Access academic resources related to the subject as well as the retrieval techniques. By conducting bibliometrics selection and settling types of literature, it is possible to analyze the research status of the topic and its research value and feasibility. As for the topic research stage, it should focus on improving the information analysis and utilization ability of students. By conducting information retrieval case study on the research topic, students will know more about the selection of retrieval key words and the formulation of proper retrieval strategies. Moreover, by introducing utilization skills of documentary delivery, participating into the study activities in class and design of research, providing analysis and prediction report on disciplines and relevant fields, offering reliable consultant service in knowledge,

information and study, offering strategic guidance on the development of teaching and discipline, it is possible to develop the information literacy education model based on ADAI. In the thesis writing stage, students have to be informed of the importance of information ethics, information morality, intellectual rights and awareness of information protection. Moreover, introduction to literature management software such as NoteExpress could also be provided for students to gain effective and intelligent management over larger number of literature as well as the automotive unification of reference lists. In addition,

relevant trainings for non-teaching groups such as the Communist Youth League, school unions and newly enrolled teachers should also be attached with enough attention.

4.3 Establishment of resources sharing platform in mobile library and construction of interactive study model on electronic media

The development of mobile Internet technology has endowed information obtaining and exchange with new features. People tend to make use of Social Networking Service (SNS) to gain access to information and conduct information communication activities. Revolution in the clouding era has contributed to the application of E-Knowledge in digital library. As for the mobile digital library, it is based on the mobile wireless communication network, integrated management system platform as well as information resource integrated with metadata. The mobile digital library focuses on adapting to the purpose of one-stop information retrieval on mobile terminals by making use of clouding sharing services. On the basis of handheld mobile terminal devices such as intelligent mobile phones, tablets and electronic books, users can retrieve and read digital information resources, query library collection, manage personal lending book, retrieve journal articles in Chinese or foreign languages, read electronic book, read newspaper, receive up-to-date information on recommended books as well as speeches delivered by the library. In addition, with the help of public platform on Weixin, libraries will be able to establish an information exchange platform on which users will utilize video resources and make full use of scattered time on the mobile terminals. And the application of social networking platforms will provide users with information literacy education, which is considered to be the necessary model of conducting embedding information literacy education in the social networking era and an important part of constructing the third space of libraries.

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