

STUDY OF UNDERGRADUATE INFORMATION LITERACY AND THE ROLE OF UNIVERSITY LIBRARY IN THE INFORMATION LITERACY PROGRAM

Szu-Chia Lo¹

Abstract *This paper describes the results of the study of undergraduates' information literacy and skills. The purpose of this study is to determine their strengths and weaknesses in terms of their information literacy and skills by observing the information search behavior. The methods used in this study included a number of qualitative methods and were applied while students conducted a research project. In general it was found that students had limited skills in the area of information literacy. Based on these findings recommendations were proposed to help enhance information literacy and skills and incorporate their delivery in the university curriculum. The paper shows that incorporation in the curriculum is a necessity for the successful delivery. In addition the implications of these changes for library and librarians were indicated.*

Index Terms *Information literacy, university library*

INFORMATION LITERACY IN KNOWLEDGE AGE

As we head toward the information era, the human capital is worth more than either produced assets or natural resources. The notion such as "Information Society", or "Knowledge Economy" reflects the view on the same concept. The library is no longer just a place used as a mechanism for storing materials or acts as an information provider. One of the objectives of library services is to increase the access to the information resources. The development of the information technologies does make it easier for the user to approach information. However, in the increasing complex environment, user has to face diverse information resources and it becomes harder for user to identify, locate, evaluate and use effectively the needed information. As the demand of the information literacy increases, library needs to take on more extended role to work with library users in this area. New programs need to be introduced. Information literacy has been defined as a set of abilities requiring individuals to "recognize when information is needed and have the ability to locate, evaluate, and use effectively the needed information." [1]

Due to the increasing importance of information literacy and some signs suggest that the students might be weak in some of the abilities mentioned above. It is necessary for the library explore this area. McCarthy, Krausse and Little conducted a research project on students' choices of information media [2]. In their paper published in 1995, Metha and Young described the methods that the faculty in

University of Alabama used to obtain the needed information [3]. Hsieh-Yee worked on a similar project to find out how the students in American University and University of the District of Columbia approached information [4].

This paper describes the results of the study of undergraduates' information literacy and skills. The purpose of this study is to determine the strengths and weaknesses in terms of the students' information literacy and skills by observing the information search behavior. The methods used in this study included a number of qualitative methods and were applied while students conducted research projects. Based on the findings of the study, recommendations might be proposed to help enhance information literacy and skills and incorporate their delivery in the university curriculum.

STUDY OF INFORMATION BEHAVIOR

The study addressed the understanding of the user's experience in the process of seeking information. The primary questions answered by this study were: How do the students approach the information they need? What is the process of the information search? Are there common patterns in the information search process? What are the common issues that the students encounter during the process? What is the impact of the retrieval information on the learning process?

The study was a qualitative exploration. It was taken during the spring semester of year 2000. The students from two library courses were chosen to participate this study. There were 67 students in this study. All the students were given a research paper assignment. Each participant needed to choose a topic for the research paper, find information that helps him or her to accomplish the task. In this longitudinal research, several research methods were used. Besides writing the paper, each participant was asked to keep a journal to record the feeling, events and actions he or she encountered during the completion of the assignment. Several focus group meetings were also conducted. The students were placed in a highly interactive environment to share the experience they had during the process. Interview was also used as an instrument to probe the questions needed to be answered. Assignment assessment was a checking point for the data collected through other methods. This study took place over an extended period of time and the results were not constructed base on one single instance.

¹ Szu-chia Lo, National Cheng-Kung University, University Library, Tainan 701, TAIWAN, R.O.C losu@mail.ncku.edu.tw

- **Journal:** The students kept journals during the completion of the assignment. They were asked to keep records on how the topics for the papers were chosen, how they completed the tasks, how the information was found, thoughts and actions occurred during the process. The journals gave the author an opportunity to understand what the process was from the students' description without restrictions on the format or the length.
- **Focus group:** The focus group discussions were conducted during and after the completion of the assignment. The meetings were designed to place the student in a highly interactive environment to discuss the paper they worked on and the issues they encountered during the process. Those discussions might present some new insights that were not shown in the journals or interviews that were conducted after the students handed in their papers.
- **Case study:** In order to get more understanding of the personal experience, perceptions and the process of information search, the method of case study was employed in this study. By interviewing the participants, the students had a chance to describe the process in different setting. It also gave the author an opportunity to confirm the assumptions and findings that the author concluded. Besides the process of this assignment, the author had a chance to obtain information about the information searching experience that the students had from other instances through interviewing the students in person. Eight students were asked to be the subjects of the case study. The students were interviewed from one hour to one and half hours.
- **Assignment assessment:** At the end of the assignment, each paper was analyzed to confirm the findings that were concluded from the data collected through other methods. The assumption was that the students who fully understood the process and knew the strategies of finding information would produce more focused papers.

The ground theory [5] was the foundation of this study. Several methods were used to collect the fullest description of the situation and the description provided a real-life experience base for analysis and findings. The data collected from the application of different methods were examined for the pattern of the process.

MAJOR FINDINGS AND IMPLICATIONS

Based on the collected data, the pattern of the search process could be drawn. From this pattern, the author obtained better understanding about what the students' approaches to complete an information search task were. From the understanding, the information services could be revisited to meet the information needs.

Stages of the Search Process

It was found that there was a common pattern for the search process. When the students were aware of the information needs after the assignment was assigned, the information searching process started. The first stage of the process was initiation. The students came to realize that the information might be needed to complete the task. After the recognition of the task, the process moved into the selection phase. The general area was identified as a starting point. At the first two stages, most of the students experienced the uncertainty. In lots of cases, the students were not sure what they should do. They did not know if they were on the right track, if the effort they put in could pay off. The uncertainty took the students into the next stage, formulation. At this stage, the students were seeking background information from different resources, such as personal experience, asking around, pre-information searching ... etc. to identify more specific topics for the general subject area. During the formulation process, the students tried to make sure that there was enough information for them to work with. They also tried to predict the possible outcome. Once the specific topic was chosen, the information retrieval process began. If the students did not get positive results from this process, they might start a new cycle, go back to the previous stages and the topic might be reexamined. Writing the paper was another difficult task for the students. How to organize the information retrieved was a challenging task for most of the students in this study. The following presents more details on different stages.

- **Initiation:** The initiation presented the recognition of the information needs. When the paper assignment was given to the students, the students initiated the task of information search. The students transformed the task into serial questions and problems. During the transforming, the students realized that they had to identify the specific topics they could work on and tried to obtain the necessary information to complete the assignment.
- **Selection:** After the initiation stage, the students started the process of choosing topics to work with. At this stage students collected ideas about the topics. There were basic criteria for students to make decision. The students tended to choose topics that they were familiar to work with. Some of them would find ideas from the current events. One of the reasons was that the students assumed that it was easier for them to find information. The students would try to predict the possible outcome. They also wanted to make sure that there was enough information for them to work with. Personal interest was one of the factors that would have impact on the choices of the topics.
- **Exploration:** After the topic was chosen, the students went through the exploration stage. In this stage, the students tried to find more information from different sources about the chosen topic. Through this process,

the insights could be revealed and the student were ready to narrow the research topic from a general one to a more specific one.

- **Formulation:** After revealing the insights of the chosen topics, most of the students knew what they wanted to do for the paper. When the focus formed, the students felt more comfortable about the task, the uncertainty reduced to the bearable level. On the other hand, some of the students encountered the difficulties to focus on the topic, the level of uncertainty increased. The students felt frustrated and might lead to complain or give up.
- **Collection:** When the students started to search for information, it showed different levels of the abilities of obtaining information. Each student had his or her own search strategies to find information. Some of the methods that the students learned from previous library instruction programs were acquired, but very limited.
- **Presentation:** The final task of this assignment that the students needed to accomplish was to write a paper for the topic they chose. It gave the student an opportunity to present the ability of the organizing the information obtained. Each individual used different technique to write the paper.

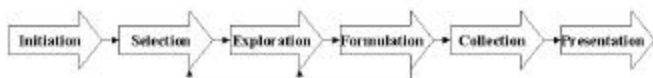


FIGURE. 1
SEARCH PROCESS MODEL.

The study revealed the process of information search. The results resemble the findings in other studies [6]. Some of the stages were overlapping, merging and recurring. The students experienced different feelings in different stages. It was common that the students felt confusing and uncertain at the early stage of the process. As the process moving on, the students became more confident and more comfortable with the assignment. With the searching experience, the students might go through different stages one by one, but some of the students might encounter more difficulties and go through several cycles of the process.

Impact Factors on Topic Choices

There were five factors that had more impact on the choices of the topics. Students chose the topic for the paper based on the following criteria, personal interests, current affair, hot topic, major, and the availability of information.

Personal interests played an important role when the students tried to decide the topic for the paper. Personal interests were something that the students were familiar with. The students already had basic knowledge about the topics. For those students who chose personal interests as the report topics, they felt more confident to continue the assignment and thought they could finish the task without any problems. Current affair was another popular choice.

Since it was something that just happened recently, the students thought about these events easily when they were looking for something to write about.

Surprisingly, the topics relate to the students' major were not chosen as many as the author expected. Author asked the students why they did not choose topics from their majors for the paper in the interviews. All the interviewees gave the same answer. There was no need for them to find extra information when they had to work on something related to their majors. It did not meet the requirement of finding information for this assignment. Author asked the same question in the focus group meetings and private conversations, the results were similar. They either could get the information they needed from the textbook, or they could get by through asking around without any serious information search. It indicates a working relationship between faculty and librarian should be build.

Focus Formulation

There were several techniques acquired during the focus formulation stage. When the assignment was given, the students started to identify the topics that they could work with and the next step was to explore the information about the topics. Before the students could start to work on the paper, most of them needed to list the ideas about the topics that could be the research problems for the papers. Another important task was making the prediction of the possible outcome. In the search pattern that was found in this study, several methods could be listed that assisted the students to formulate the focus.

- **Pre-focus Exploration:** When the topic was first chosen, the student started to investigate some information in order to find a focus for the paper. During this process, the students obtained the information about the general topics.
- **Topic Clarification:** Before the students could head toward next step, the students needed to find a focus based on the information they had on the general topics. Clarification of the topic and identifying several possible topics were two common used strategies.
- **Personal Network:** The suggestions from experts or peers were also needed during the formulation. If the students felt confused during the pre-focus exploration or the clarification, they would find someone who could refine the issues for help. The faculties or seniors from the same department, friends from student clubs, members from the cyberspace community were the possible solutions providers.

Search Strategies

From the journals and the references listed in the papers, the search strategies and resources used could be identified. The search strategies taught in the previous library instruction programs were not applied as much as expected. The findings on this section showed strong evidence that the library instruction programs had to be revisited, and the user

interface of the information systems might need to be redesigned.

- **Information Retrieval Model:** Two tracks of the search process could be traced in the information retrieval model. One was using the library catalog to locate ‘books’ that relate to the topics, and another one was connecting to one of the search engines to find the relevant web pages or web sites by keyword search.

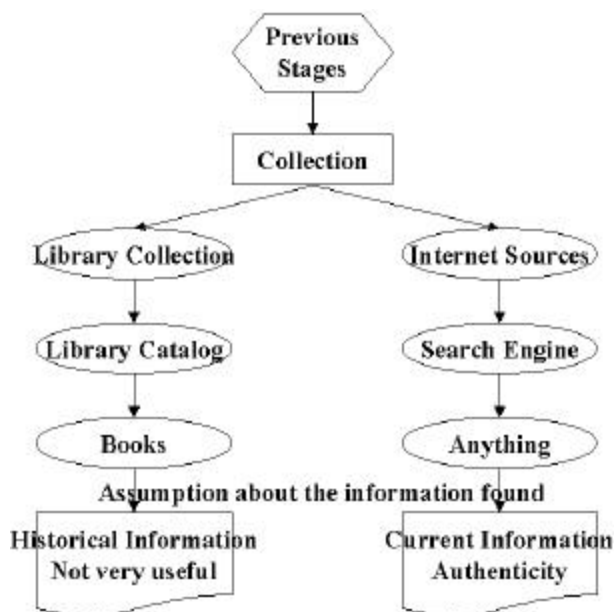


FIGURE. 2
INFORMATION RETRIEVAL MODEL.

The worrisome was that the assumption the students made about the information found from these two methods. Most of the students thought that the information they might be able to obtain from the library catalog was in the book format only and the current-ness of the information might not be useful to them. On the other hand, the students showed more interests in finding information through Internet. For some students, the search engines were the gateway to all the information available online. It was also shown that it was not easy for the students to tell the authenticity of information on the Internet.

- **Minimum Use of the Information System:** The model in the figure 2 shows that the information systems provided in the library were not fully used, except the library catalog. It brought our attention that if the library should put in more efforts on the promotion of using those databases or the library should reconsider the acquisition policy on the information systems. It is also possible that the systems that the library acquired could not fulfill the information needs.
- **Keyword Oriented Search Strategies:** The most used search strategy was the keyword search. Despite there are different search functions designed in information retrieval systems (namely library online catalog and

search engines), keyword search was the favorable method. Keyword search guaranteed the search results in most of the cases. However, it did cost students more time to browse the result and identify the relevant items. In some cases, the students missed important information.

- **Identifying the “Purl”:** Since the most common used search method was keyword search, without further weighting system, students tended to select the first listed information from the search result without identifying the most relevant information. It presented another problem in the locating and evaluating the proper information to fulfill the information needs.

THE EXTENDED ROLES OF UNIVERSITY LIBRARY

The way the user approaches the information is not as simple as we thought from the result we got from the study. It shows that the roles of the university library and the librarians could be expanded to new era. The library and the librarian will continue the works on collecting, organizing and finding information resources; and applying advanced technologies to provide access to vast information. More important is what kind of responsibilities the library and the librarian have in enhancing the user’s information literacy. The result of the study revealed that the information services and the retrieval systems used in the library are not familiar to the users. It is necessary for the library to establish programs to promote the use of the resources. Although there have been bibliographic instruction programs designed, it shows that those programs offer partial pictures of the information literacy. Most of the students will not take it serious without demands of being information literate from other courses. It is important to set up programs to cover all aspects of handling information and have those programs incorporate into the curriculum.

Besides the instructional programs, user study and information research in the field are the areas that the library should continue to work with different groups of users in the university environment to get in-depth understanding of the users to design different programs to meet different information needs. Those conclude new roles for the university library and librarians, educator, researcher, information and curriculum coordinator.

- **Educator:** Establish and execute the comprehensive programs for the information literacy.
- **Researcher:** Provide information service in a more user oriented environment. It is necessary for the library community continues to carry on research projects to investigate different prospects in information search behavior.
- **Information and Curriculum Coordinator:** Be part of the university community, the university library carries the responsibilities of supporting the information needs of research and curriculum. It is important for the

university library takes more active role in coordinating the information resources and curriculum.

When the librarian provides the information services, it is necessary for the librarian to know that the users experience various feeling during the process and seek different types of information to reduce the uncertainty and accomplish their tasks. Based on the understanding, the librarian should offer proper assistance within the context; consider the characteristics of each individual situation.

REDESIGN OF THE INFORMATION LITERACY PROGRAM

Most of the university libraries in Taiwan have been offered the information literacy programs. The contents of the programs put more emphasize on the training of the information skills. The topics that are discussed in those programs include 1) Introduction of information literacy, 2) Library Services and Collections, 3) Access to Library Collections, 4) Reference Services and Reference Materials, 5) Information Retrieval, 6) Internet Resources. The previous studies showed that the students who participated those programs did demonstrate better skills in information retrieval and felt more comfortable during the information search process [7]. However, the students still experience the uncertainty and agony when they need to conduct a research project on their own. The University Library of National Cheng-Kung University has been offered the information literacy program since 1992 and one new program is currently under construction. It is a continuing program to the present one. The teaching goal of this new program is to set up a model for application of information skills in different stages of search process. Through conducting different search projects, the participants could learn from the context. The outcome of the program is expected later this year.

CONCLUSION

Information technology changes the way that the information is handled. From production, collection, organization, accessing to using the information, the development of information technology presents the new methods for us to approach the information resources. Those changes certainly give the library a chance to expand the role as information mediator. We do need to think about what input could be contributed to the search process based on the model found. It is necessary to reengineer the way the information is presented to make it more visible and accessible to the users. For the professions who work in this field, could certainly enrich the process by expanding the horizon and depth of the understanding of the search process. By doing so, the result of the search process and research work could be improved.

ACKNOWLEDGMENT

Thanks those students who participated the study for the effort they put in.

REFERENCES

- [1] Association of College and Research Libraries, "Information Literacy Competency Standards for Higher Education," found at <http://www.ala.org/acrl/ilintro>, April 2001.
- [2] McCarthy, Cheryl A., Krause, Sylvia C. and Little, Arthur A., "Expectations and Effectiveness Using CD-ROMS: What Do Patrons Want and How Satisfied are They?" *College & Research Libraries*, Vol. 58, No 2, 1997, 128-142.
- [3] Mehta, Usha, and Young, Virginia E., "Use of Electronic Information Resources: a Survey of Science and Engineering Faculty," *Science & Technology Libraries*, Vol. 15, No 3, 1995, 43-54.
- [4] Hsieh-Yee, Ingrid, "Student Use of Online Catalogs and Other Information Channels," *College & Research Libraries*, Vol. 57, No 2, 1996, 119-131.
- [5] Strauss, Anselm and Corbin, Juliet, *Basics of Qualitative Research: Techniques and Procedures for Developing Grounded Theory*. Thousand Oaks: Sage Publications, c1998.
- [6] Kuhlthau, Carol Collier, *Seeking Meaning: Approach to Library and Information Services*, Norwood, N.J.: Ablex, 1996
- [7] Lo, Szu-chia, "Information Literacy Program and the Impact," *National Cheng Kung University Library Journal*, No 6, 2000, 77-102.