Cataloging and Metadata Education: A Proposal for Preparing Cataloging Professionals of the 21st Century

A response to Action Item 5.1 of the "Bibliographic Control of Web Resources: A Library of Congress Action Plan"

submitted to
The ALCTS/ALISE Task Force

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by

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* Web version does not include budget information, implementation details and appendixes.

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Executive Summary

This proposal was developed in response to action Item 5.1 of the LC Action Plan for Bibliographic Control of Web Resources. The charge was to "prepare a model curriculum for cataloging and continuing education" which should " focus on teaching cataloging and metadata to new librarians," "recommend specific changes and additions to existing library school curricula," and "cover the period through 2005." The principal investigator reviewed the literature on cataloging education, metadata education, information organization, metadata, and future of cataloging and libraries to obtain background information and identify related studies. In addition, a survey of 52 ALA-accredited programs in the United States and Canada was conducted in April and May of 2002 to obtain data on their coverage of cataloging and metadata.

Issues considered during proposal development

Several issues were taken into account in the development of this proposal. In addition to the literature on cataloging and metadata education, current coverage of cataloging and metadata in LIS programs was analyzed. Then research on the future roles of LIS graduates in information organization and the competencies needed were reviewed to provide a context for curriculum development. In addition, educators' views on cataloging and metadata education were examined because of their implications for instruction.

Program objectives

The proposed program was designed to achieve the following objectives:

- To inform the information community of our effort to improve and enrich cataloging and metadata education.
- To promote the integration of metadata topics into cataloging education.
- To identify levels of expertise in cataloging and metadata and competencies in leadership and management to help prepare cataloging professionals of the 21st century.
- To assist educators and anyone who cares about cataloging and metadata education to prepare for teaching in this area.
- To enrich educators' knowledge of cataloging and metadata by providing opportunities for educators and practitioners to brainstorm best teaching strategies for providing the recommended levels of expertise.
- To assess the effects of the proposed actions on cataloging and metadata education in three years and determine the next course of actions.

Program components

In response to the state of LIS cataloging and metadata education and changes in the information environment, the proposed program includes several components to achieve the program objectives, including

1. **Expertise in cataloging and metadata**: Since all LIS programs have their priorities and local constraints and are likely to want to implement any changes in

their own way, instead of offering a range of courses to be taught, the proposal recommends three levels of expertise in cataloging and metadata: Expertise for all LIS graduates, expertise for metadata catalogers, and expertise for leaders of cataloging and metadata projects. For each level specific knowledge and skills are listed for instructors' consideration. Implementation options are described, but it is fully understood that educators can best decide which approaches are most appropriate for their students in their particular environments.

2. **Leadership and management competencies**: leadership and management competencies needed by cataloging professionals are highlighted to remind educators and students of their importance. These competencies cover six areas: 1) mission and values, 2) cooperation and collaboration, 3) communication and interpersonal skills, 4) problem solving, 5) managerial skills, and 6) growth and change. Suggestions for teaching these competencies in LIS programs are offered.
3. **Action plan:** In response to the current state of cataloging and metadata education specific changes to cataloging related courses were recommended to educators. In addition, a plan was developed to encourage educators to help students obtain the recommended expertise. The plan includes 1) an announcement to the field of the levels of expertise and competencies recommended; 2) a "Metadata Basics" information package for educators, practitioners and students; 3) a listserv for people who care about cataloging and metadata education to communicate; 4) a Web Clearinghouse for resources related to teaching cataloging and metadata; and 5) a one-day conference on teaching strategies for educators and practitioners to

share experience and brainstorm solutions. Implementation and evaluation of these actions are described in detail in the report.

Timeline

The proposal covers a three-year period from 2003 to 2005. Four proposed actions will take place in 2003 and the fifth action, the one-day conference, will be held in January 2004. The Web Clearinghouse for Cataloging and Metadata Education will be too new for evaluation in the spring of 2004, but evaluation data for the other four actions will have been collected by then. In May 2004 a report on the implementation and evaluation of the proposed actions, except the evaluation data for the Clearinghouse, will be ready for the funding agencies. At the 2004 ALA annual meeting the report will be presented to the library community.

Evaluation of the long-term impact of the proposed actions will take place in 2004 and 2005. In September 2004, a year after the Web Clearinghouse was launched, a Web survey will be conducted to identify areas for improvement and enrichment. The data will be for internal use only. In April 2005 LIS programs will be surveyed to determine the state of cataloging and metadata education. The objective is to determine whether the five proposed actions have resulted in improvement in LIS programs' coverage of cataloging and metadata. Data from this study will be compared with the survey conducted in 2002 for this proposal. In September 2005 a Web survey will assess the impact of the Web Clearinghouse. Reports of these two major surveys will be completed in October and November of 2005. A Task Force will prepare their reactions to the findings and begin

planning for the next steps. At the 2006 ALA mid-Winter meeting decisions will be made about how to proceed to ensure quality cataloging and metadata education.

Cataloging and Metadata Education: A Proposal for Preparing Cataloging Professionals of the 21st Century

Proposal background

This proposal was prepared in response to an action item of the LC Action Plan for Bibliographic Control of Web Resources. The goals of action Item 5.1 are to

> 5.1 Improve and enhance curricula in library and information science schools by (1) identifying and preparing students with core competencies for library technical services (e.g., analytical skills, partnering and interpersonal skills); (2) devising and conducting training to produce flexible and resourceful cataloging professionals with an appropriate mind set and values and advanced problem-solving, operations, management and information technology skills; and (3) promoting the understanding and use of metadata standards (such as Dublin Core) for describing and managing electronic and digital resources, with the goal of enabling greater participation of new LIS professionals in the development and refinement of metadata standards used both within and outside libraries.

The ALCTS/ALISE Joint Task Force charged the principal investigator with a task to "prepare a model curriculum for cataloging and continuing education" which should "focus on teaching cataloging and metadata to new librarians," "recommend specific changes and additions to existing library school curricula," and "cover the period through 2005." Issues of continuing education are to be addressed by another Task Force.

The proposal was developed from a review of the literature on cataloging education, metadata education, information organization, metadata, and future of cataloging and libraries. In addition, a survey of 52 ALA-accredited programs in the United States and Canada was conducted in April and May of 2002 to obtain data on their coverage of cataloging and metadata. Members of the ALCTS-Education Task Force reviewed a draft of the proposal and offered valuable insights on curriculum revision. Most of the Task Force's suggestions have been incorporated into this final report.

Introduction

The need for cataloging and metadata education

Cataloging education has been a subject of much interest and debate for several decades. Educators and practitioners analyzed course offerings,[1, 2, 3, 4] examined course contents,[5, 6,7] discussed trends, [8, 9, 10, 11, 12] and described teaching philosophy and strategies.[13, 14, 15, 16] MacLeod and Callahan surveyed employers and found cataloging education inadequate for preparing students for cataloging positions.[17] Vellucci and Spillane both noted reduced emphasis on cataloging in LIS programs.[18, 19] In a paper prepared after the American Library Association Congress on Professional Education, Hill and Intner described the evolution of cataloging to knowledge management and expressed concern over LIS programs' neglect of cataloging education.[20] Gorman deplored some LIS educators' move to replace cataloging with metadata.[21] And Intner expressed continuing concern over the inadequate treatment of nonprint materials in cataloging courses.[22]

Many practitioners and educators have recommended topics for cataloging education.[23, 24, 25, 26] In a study by MacLeod and Callahan educators reported that they considered the needs of practitioners when they developed courses,[27] but practitioners felt their concerns were not heard. In spite of such differences in perspective, two recent studies by Letarte and Turvey found educators and practitioners agreed on many cataloging competencies for entry-level academic librarians.[28, 29] Professional associations also tried to provide guidance in this area. The ALCTS Educational Policy Statement offered a comprehensive list of competencies for many technical services functions, including cataloging, in 1995.[30] In 2002 the ALA Task Force of Core Competencies presented a draft document reiterating the importance of cataloging to

library services.[31] The value of cataloging knowledge and skills was endorsed by many practitioners[32, 33, 34, 35] and educators.[36]

In a Delphi study on metadata's implications for LIS curricula, metadata experts identified the roles future LIS graduates are expected to play in information organization and offered advice on knowledge and skills all LIS students should have. They also named specific subjects for in-depth coverage for students who aspire to be metadata specialists.[37] In a related survey practitioners also support this list of metadata topics for metadata education.[38]

Many factors have affected cataloging. Hill observed that cataloging is a specialty highly impacted by technology and economic factors.[39] Taylor reviewed a quarter century of cataloging education and concluded that new technologies have increased the content burden of cataloging courses.[40] Frost observed cataloging courses have had to evolve to cover the organization of various types of resources, and such change makes teaching and learning cataloging more exciting.[41] Interesting enough, technology and the proliferation of digital resources did not lead to increased emphasis in cataloging. Park found only seven of the 45 schools analyzed have covered Internet cataloging,[42] while Joudrey found 5 of the 54 schools studied did that.[43]

This phenomenon may be related to the fact that the necessity of cataloging, especially the cataloging of digital resources, has been called into question by many. Citing the complexity of cataloging rules, the cost of cataloging practice, and the dynamic nature of Web resources, critics of cataloging rejected it as a suitable solution for organizing Web resources.[44, 45, 46, 47, 48] Many in the cataloging community, however, have concluded that cataloging principles can be applied to digital resources[49] and

cataloging important Internet resources will add value to the resources by collocating them with resources in other formats, facilitating access, and saving users' time.[50, 51, 52, 53]

In addition, there are more forces challenging cataloging. For example, cataloging standards are in direct competition with many newer metadata schema for being the standards for document representation. This is because many disciplines have designed their own metadata schema to support the organization of information in their fields. Text Encoding Initiative[54] and Encoded Archival Description[55] are examples. Dublin Core,[56] as a domain-free scheme that is easy to understand and adopt, also poses much competition for records created according to AACR and in MARC format. The metadata phenomenon has caused Reynolds to demand "Cataloging must change!"[57] but others believe the relationship between cataloging and metadata can be complimentary. Thomas, for instance, pointed out future online catalogs are likely to draw on the strengths of cataloging and metadata[58] and Gorman suggested that records be produced at different record levels, using cataloging data or metadata elements as appropriate.[59]

Another challenge to cataloging comes from new technologies for organizing digital resources. Search engines, the CORC project[60, 61] INFOMINE,[62] XML,[63] concept mapping systems like Oingo,[64] and the Open Archive Initiative[65] reflect increased machine involvement in information organization. The roles of human beings in the information organization business have changed.

As cataloging is challenged, educators have begun to change cataloging education. For example, Hsieh-Yee described strategies to incorporate metadata into a number of cataloging related courses,[66] and a very small number of programs now cover the cataloging of Internet resources.[67, 68] Hsieh-Yee also identified ten issues educators

need to consider when they develop a cataloging and metadata education program.[69] In addition, an action plan was developed from the Library of Congress Conference on Bibliographic Control, and in the plan is a charge to examine current LIS coverage of cataloging and metadata education and to consider how best to teach cataloging and metadata to new students. At the beginning of the 21st century, both educators and practitioners are looking ahead to update cataloging education so that cataloging professionals will play central roles in future information organization.

Roles of LIS graduates and needed competencies

To develop a plan for cataloging and metadata education two major issues need to be addressed upfront. One is about the roles LIS graduates are expected to play in the changing information environment. The other is about the expertise and competencies they must have to play these roles well. As the library and information profession field tries to define its role in the digital environment, many efforts have been made to identify core competencies for new graduates. The 1995 Association for Library Collections and Technical Services' ALCTS Educational Policy Statement offers a comprehensive list of competencies recommended by practitioners and educators.[70] The competencies encompass knowledge and skills in three major categories: 1) Topics related to users such as information seeking behavior and user needs; 2) topics related to the usage of information such as searching, access to information, knowledge of bibliographic record, understanding of the implication of data and record structure for information retrieval, precision and recall, and evaluation of information; and 3) topics in technical areas such as knowledge of cataloging principles, theory, concepts, tools, knowledge of database design, database management concept, and management.

As part of the effort by the American Library Association-sponsored Congress on Professional Education, the ALA Task Force on Core Competencies developed a draft in 2002, which states under the heading, "Organization of Knowledge Resource," that

the ability to organize collections of informational materials in order that desired items can be retrieved quickly and easily is a librarian's unique competency. Well-organized collections are the foundation for all library service.[71] The draft also states that the core competencies for librarians are about connecting users with information, connecting people to ideas, facilitate learning, management, managing the applications of information technologies, and research.

So what do students need to know to do these jobs well? Turvey and Letarte used the 1995 ALCTS Educational Policy Statement's list of competencies to develop survey instruments and found in two studies that educators and practitioners agreed on the importance of many cataloging competencies, that educators considered more competencies to be important than practitioners (31 versus 20 out of a list of 39 competencies), and that educators felt more strongly than practitioners about the competencies on which they did not agree.[72,73] The top cataloging competencies recommended by both groups for entry-level academic librarians include

- Ability to read and interpret a bibliographic record in an OPAC
- Understanding of information-seeking behaviors of users
- Knowledge of the theory of information organization and intellectual access
- Understanding of the activities that must be performed to provide the products and services users need

- Knowledge of the ways in which searching techniques affect precision and recall
- Ability to evaluate information-retrieval systems in relation to user needs and information-seeking behaviors

The 2002 draft of the ALA Task Force on Core Competencies specifies that

> Competence in organizing collections involves thorough knowledge of bibliographic and intellectual control principles and standards, understanding of how to apply these principles and standards in practical, cost-effective operations; and, the ability to collaborate with those who provide systems for managing organizational functions such as library vendors and institutional computer center staff members.[74]

This view is endorsed by Gorman who reminds us that cataloging education is critical to all would-be librarians because "cataloguing is the intellectual foundation of librarianship" (p. 11 of the manuscript).[75]

Focusing on providing students with a solid education in metadata, metadata experts in a recent Delphi study on metadata indicated that they expect these graduates to play the following roles.[76]

- To have substantial involvement in the development, implementation, evaluation of metadata and metadata projects
- To be information architects
- To be interoperability experts
- To conduct research on user needs and the utility of metadata applications

They also named the metadata concepts, theory, and topics that all students need to know:

- A general understanding of AACR2, MARC, Z39.2, name and subject authority, and classification schema, and how these components fit together. The intent is to give students a big picture, instead of preparing them to be catalogers.
- An overview of metadata, including types of metadata, purposes, communities creating metadata, applications, and emerging standards that will impact on metadata projects. An awareness of well-known metadata projects such as ROADS, CORC, and Nordic Metadata Project is also important.
- General understanding of ISBD, AACR2, APPM, TEI, Dublin Core, GILS, FGDC, VRA, EAD, Metadata crosswalks, HTML, XML, SGML (54.5% supported this). Three top standards named by metadata experts are Dublin Core, AACR, and metadata crosswalks.
- Understanding of interoperability, the role and limitations of metadata crosswalks, authority control and how it can be implemented through metadata.
- Knowledge of how library cataloging schema & practices relate to metadata.

These views were supported by metadata practitioners in a related study.[77] Similar views were endorsed by educators in the 2002 survey on cataloging and metadata education. In addition, these educators showed strong support for two statements about what all LIS students need to know: “They need to know that cataloging and metadata are not necessarily mutually exclusive. In fact, cataloging and metadata schema can be combined to organize information resources effectively” (average score of 4.6 on a 5-point scale); and “Students need to know that some catalogers are using AACR, MARC and other metadata to organize information and that they need

to know cataloging and metadata well if they would like to have a career in information organization (average score 4.7).

Metadata experts in the Delphi study also offered a list of topics that ought to be covered in-depth for students interested in a career in information organization. The list is included as Appendix 3. Some of the topics on the list are included in the proposed program below.

Educators' views on cataloging and metadata education

Another issue that deserves some attention is educators' views on cataloging and metadata and how they provide education in these two areas. While some computer scientists are eager to predict the death of cataloging and libraries,[78] a good number of educators believe cataloging plays an important role in information organization and is a good example of metadata. To some of these educators cataloging IS metadata, so there is little need to do more about metadata. But a growing number of educators appreciate the similarities and differences between cataloging and metadata. They recognize metadata is broader in scope than cataloging, and believe students need metadata education in addition to cataloging education. Table 1 summarizes educators' support for the given statements, using a five-point scale, with 5 meaning strongly agree. Educators showed a strong preference for not splitting cataloging and metadata into two separate tracks of study for students. They also agreed that many of the topics are equally relevant to students who aspire to be catalogers and those aspiring to be metadata specialists.

Table 1. Educators' views on cataloging and metadata education

Statement	Average Score	Mode
We may want to design two tracks of study, one for students interested in cataloging, and another for those interested in metadata.	2.4	1
While cataloging and metadata are similar in some ways, there are enough differences for us to devote at least one course to each subject.	3.6	5
The relationship between cataloging and metadata should be clarified in courses devoted to cataloging and metadata.	4.1	5
We need to stress the value and purposes of cataloging and show students the application of cataloging principles and concepts to the organization of resources in various formats.	4.6	5
We need to have some coverage of metadata in cataloging course(s) because both cataloging and metadata are about information organization.	4.6	5
Students need the knowledge and ability to place metadata in a larger ontology of knowledge management methods, and have an understanding of the role of metadata vis-à-vis cataloging metadata, classification, subject analysis, authority control, controlled vocabulary, and other similar practices.	4.6	5
We need to give them the knowledge and skills to identify areas for metadata development, application, and evaluation. This topic is equally relevant to aspiring catalogers and aspiring metadata specialists	4.2 62%	5
We need to help them understand issues of cross-collection, cross-domain searching and various approaches for ensuring interoperability between metadata schema. This topic is equally relevant to aspiring catalogers and aspiring metadata specialists	4.2 76%	5

metadata specialists		
We need to give them a thorough understanding of a variety of metadata schema and markup languages, their applications, strengths and weaknesses, and impact on library systems. This topic is equally relevant to aspiring catalogers and aspiring metadata specialists	4 64%	5
We need to give them experience in implementing a metadata project, including needs assessment, project management, metadata scheme adoption and adaptation, metadata creation, etc. This topic is more relevant to aspiring metadata specialists This topic is equally relevant to aspiring metadata specialists and aspiring catalogers	3.9 49% 51%	5

This need for students to know about metadata and cataloging as related subjects is important. Even Gorman, who has defended cataloging from metadata advocates' attacks, acknowledged the role metadata schema such as Dublin Core can play in the control over Web resources.[79] Thomas commented on the potential of the catalog as a portal and urged us to exploit and make explicit the applications of cataloging principles and practice in the digital environment.[80] What the literature and data suggest is that all students should have a good understanding of the relationship between cataloging and metadata and that a cataloging and metadata curriculum will benefit aspiring catalogers and metadata specialists.

The proposed program

Rationale

Concerns for the provision of cataloging and metadata education in LIS programs provided the impetus for a recent study of LIS programs' coverage of cataloging and metadata education. Findings of the study are included as Appendix 2 to this report. Major findings are

- Cataloging education has indeed been reduced. There is a pattern of providing general coverage of cataloging in a required introductory course such as information organization or knowledge organization instead of offering a cataloging course.
- A small number of programs offer a cataloging course as their introductory course and require it.
- Programs that devote an entire course to cataloging have covered standard topics such as descriptive cataloging and subject analysis, but not all of them cover the cataloging of electronic resources and few have covered metadata topics in depth.
- Programs that offer a course on advanced cataloging do not offer them often, probably due to student size and faculty availability. Most of these courses focus on cataloging issues and provide limited coverage of metadata topics.
- A handful of programs have developed courses on metadata but there is no consensus yet on what ought to be covered in such courses.

These findings suggest that cataloging education has lost some ground to other topics and coverage of metadata topics remains at a basic level. This state of cataloging and metadata education deserves our attention because many changes in the information environment indicate that cataloging and metadata are critical to information

organization, management and services. Changes of particular interest to the LIS professionals are

(1) Rapid growth of information in various formats challenges the LIS field in organizing information resources for access. In addition to books, journals, audio and video data, digital resources are growing quickly and new media formats are likely to emerge. LIS graduates will need cataloging and metadata education to connect users to information effectively and efficiently.

(2) The control of electronic resources is critical and catalogers have much to contribute. LIS programs need to produce more students with expertise in cataloging than they currently produce, and students also need to know about metadata to understand the strengths and limitations of using cataloging and metadata to organize resources. As more graduates are prepared for the organization and management of electronic resources, the field will have a greater impact in the digital environment. This will require the enrichment of cataloging courses and a solid metadata education.

(3) There is a strong need for the LIS field to maintain relevance to information organization effort and to play active roles in charting the future of information organization. Our strengths come from our knowledge of information organization principles and applications, our focus on users, and our research and understanding of user behaviors, search strategies and techniques, and information retrieval. By applying and adapting the principles and standards of bibliographic control to digital resources, we will help control and manage information and make sure users' needs and concerns are addressed in

information systems. As we become more involved in the design, testing, implementation, and evaluation of information tools and standards, we will help produce better tools for users and information organizers.

(4) The need to organize information in a context broader than the library setting has become more urgent. Individuals, government agencies, corporate bodies, non-profit organizations, museums, archives, and other bodies are interested in producing digital resources for access and preservation. Expertise is badly needed, [81,82] and the LIS field should seize the opportunity and assert a central role in organizing information in the digital world.

It is therefore critical that we produce flexible and resourceful cataloging professionals who are able to participate in the development and refinement of metadata standards used within and outside library settings. To do so, we must provide students with knowledge and skills needed for information organization purposes and help them develop competencies in problem solving, communication and partnership.

Significance

The program presented below is significant in that it proposes the integration of metadata topics into cataloging education. The survey conducted for this proposal found that many educators shared this philosophy. Rapid development of metadata schema in recent years and the implementation of many metadata standards in digital collections and libraries have caused concerns about the future of cataloging, and some discussions of cataloging and metadata have set up an artificial dichotomy between them. This is the time when educators need to clarify for students what cataloging means, what metadata is, and what

roles they play in organizing information. If the next generation of LIS professionals are to be efficient information organizers and if the LIS field intends to play a central role in information management in the digital era, cataloging must be taught to all students and metadata topics ought to an integral part of that education. Recognizing differences in LIS programs' structure and resources, the proposed plan presents levels of expertise and specific knowledge and skills students should have depending on their career goals. Individual LIS programs can decide for themselves how best to help students obtain these levels of expertise.

The significance of the proposal program lies in how the knowledge and skills recommended will assist educators in equipping students with different level of expertise to function in the digital environment. Students with Level I expertise will have the appropriate mindset and values to understand and appreciate cataloging and metadata and their roles in information organization and access. They will be knowledgeable information professionals who are excellent searchers and can assist users in accessing information efficiently. Level I is recommended for ALL LIS students.

Students with Level II expertise will know how to describe and manage print and electronic resources using cataloging principles, standards, and tools. They will also know how to use a non-cataloging metadata scheme for the same purpose. This new generation of LIS graduates will understand cataloging and metadata well enough to select the most appropriate approach for their particular projects. Students with Level III expertise will have cataloging expertise with resources in various formats, possess information technology skills and be prepared to play active roles in applying metadata standards. Furthermore, they will have the ability to develop, evaluate, manage, use,

exchange and control metadata and be prepared to engage in the development of metadata at the local and international levels. Graduates with these levels of expertise will help improve the control of electronic resources, help system designers to produce better information tools and systems for users, and demonstrate the contributions LIS professionals can made in the digital world.

The program is also significant in that it stresses the importance of leadership and management competencies in addition to expertise in cataloging and metadata standards and applications. Because these competencies are essential for information professional to succeed in the 21st century, the proposed program calls on ALL LIS educators to help prepare a new generation of cataloging professionals. Technical knowledge and skills will be covered by faculty with expertise in cataloging and metadata, but leadership competencies require concerted effort from the faculty. Through exercises, discussions, and projects in various courses and examples of faculty engaging in research and applications and participating in actions of professional organizations, students will develop the appropriate mind set and values of LIS information professionals.

Objectives

The program is designed to achieve the following objectives

- To inform the information community of our effort to improve and enrich cataloging and metadata education.
- To promote the integration of metadata topics into cataloging education.
- To identify levels of expertise in cataloging and metadata and competencies in leadership and management to help educators enrich their curricula.

- To assist educators and anyone who cares about cataloging and metadata education to prepare for teaching in this area.
- To enrich educators' knowledge of cataloging and metadata by providing opportunities for brainstorming best teaching strategies for providing the recommended levels of expertise.
- To assess the effects of the proposed actions on cataloging and metadata education in three years and determine the next course of actions.

Components

In response to the state of LIS coverage of cataloging and metadata and environmental changes described above, a plan is proposed. It includes the following components:

1. **Expertise in cataloging and metadata**: Since all LIS programs have their priorities and local constraints and are likely to want to implement any changes in their own way, instead of offering a range of courses to be taught, the proposal recommends three levels of expertise in cataloging and metadata: Expertise for all LIS graduates, expertise for metadata catalogers, and expertise for leaders of cataloging and metadata projects. For each level specific knowledge and skills are listed for instructors' consideration. Implementation options are described, but it is fully understood that educators can best decide which approaches are most appropriate for their students in their particular environments.
2. **Leadership and management competencies**: Leadership and management competencies needed by cataloging professionals are highlighted to remind educators and students of their importance. These competencies cover six areas:

1) mission and values, 2) cooperation and collaboration, 3) communication and interpersonal skills, 4) problem solving, 5) managerial skills, and 6) growth and change. Suggestions for teaching these competencies in LIS programs are offered.

3. **Action plan:** A plan for encouraging educators to help students obtain the recommended expertise is laid out. It includes 1) an announcement to the field of the levels of expertise and competencies recommended; 2) a "Metadata Basics" information package for educators, practitioners and students; 3) a listserv for people who care about cataloging and metadata education to communicate; 4) a Web Clearinghouse for resources related to teaching cataloging and metadata; and 5) a one-day conference on teaching strategies for educators and practitioners to share experience and brainstorm solutions. Implementation and evaluation of these actions are included in the "Proposed actions" section below.

Expertise in cataloging and metadata

In discussing expertise in cataloging and metadata the first step is to clarify what "metadata" is and how it relates to cataloging. The literature offers a number of definitions of metadata:

- "Data about data"[83]
- "Metadata is data which describes attributes of a resource. Typically, it supports a number of functions: location, discovery, documentation, evaluation, selection and others"[84]
- "'Metadata' is the Internet-age term for structured data about data"[85]

- "Metadata is structured information that describes, explains, locates, or otherwise makes it easier to retrieve, use or manage an information resource. Metadata is often called data about data or information about information"[86]

The same concept in fact has been used by the library community to organize information resources for user access, and it is known as "cataloging." So it is imperative that educators help students understand this connection. Metadata, as these experts pointed out, are defined and used differently by different user communities. So LIS students should also be aware of how cultural organizations, information centers and other agencies make use of metadata. There are many technical details involved in the development and implementation of metadata. The following section will describe three levels of expertise for LIS students: Level I. Expertise for all LIS graduates, Level II. Expertise for metadata catalogers, and Level III. Expertise for leaders of cataloging and metadata projects.

The proposed program draws on the competencies identified by the ALCTS Education Committee,[87] the ALA Task Force on Core Competencies,[88] and practitioners and educators in the two recent surveys,[89, 90] and the topics recommended by metadata experts,[91] practitioners,[92] and educators in the 2002 survey on cataloging and metadata education.

Levels of expertise in cataloging and metadata

Three levels of expertise are described to offer LIS educators a blueprint of the goals and objectives of cataloging and metadata education. The discussion in this section focuses on technical knowledge of cataloging and metadata. In addition, students will need to become adept at solving problems, communicating, and collaboration. They will need to

be analytical, flexible and resourceful. These leadership and management competencies and their obtainment will follow this section on technical expertise.

Level I. Expertise for all LIS graduates

This level of expertise in cataloging and metadata is strongly recommended to **all** LIS students because when students understand how information can be organized, how intellectual access is provided, and how to make use of information tools, they will be able to identify, obtain, access, and deliver information to users. Students also need to develop an appropriate attitude toward information services and understand the values and mission of the LIS profession.

Objectives: With this level of expertise students will

- Understand how information is created, evaluated, disseminated, organized, and used.
- Have a solid understanding of the principles and methods of information organization, including cataloging, classifying, indexing, abstracting, metadata, and database creation and design. Some hands-on practice or demonstration of some of these methods will enhance students' understanding and appreciation of these methods.
- Appreciate the role of cataloging and metadata in information organization and have a good understanding of the relationship between the two.
- Have the understanding that information is organized for user access and the essence of the LIS profession is "connecting users with information".[93]

Specific knowledge and skills: A **general** understanding of the following topics is highly recommended:

- Descriptive cataloging, access points, authority control, subject analysis, controlled vocabulary (subject headings and classification), and the effects of controlled vocabulary on searching.
- Cataloging and metadata (definition, type, function), why and how cataloging and metadata records are created, how to make use of them, and how to interpret them.
- Content rules, semantics, representation rules, syntax rules and their applications in cataloging and metadata.
- Standards such as AACR and Dublin Core as examples of metadata schema for resource description and discovery and some practice with these standards.
- Encoding schema such as MARC format could be used as an example.
- Roles of bibliographic utilities and cooperative efforts at bibliographic control.
- Information-seeking behavior and information use.
- Exposure to an online catalog, a database, and a well-known metadata project.
- Hands-on practice in searching two information systems, preferably a system based on cataloging records and another based on metadata records, for students to compare the two systems. Search exercises using controlled vocabulary and natural language would increase their understanding too.

Implementation recommendation:

How this level of expertise is provided will vary from school to school depending on faculty expertise, workload, and other local factors. The survey of educators found this level of expertise, or something similar to it, has been the goal of some educators. Many schools have an introductory course on information organization or knowledge

representation and it would be quite appropriate to cover the topics recommended above in those courses. To ease the burden on these introductory courses, some topics could be covered in other related required courses, such as information systems or information services, or through special workshops such as a workshop on metadata.

Level II. Expertise for metadata catalogers

Level II expertise includes the knowledge and skills beginning catalogers will need. The expertise at this level focuses on cataloging and metadata standards. The recommendations are developed with the understanding that local training will be needed to help them become familiar with local cataloging procedures.

Objectives: With this level of expertise students will be able to

- Perform descriptive cataloging and subject analysis of print and electronic resources and understand challenges posed by electronic resources.
- Understand the objectives of the catalog and how the objectives can be achieved.
- Have knowledge of national and international standards such as AACR2 and MARC.
- Use metadata and know how to integrate metadata into cataloging records.
- Understand the tradeoffs in organizing information with cataloging and metadata standards.
- Have a solid knowledge of a selected metadata scheme, such as Dublin Core, know how to evaluate its effectiveness, and how it compares with traditional cataloging standards.

Specific knowledge and skills: A solid understanding of the following topics is strongly recommended.

- Information cycle, scholarly communication, methods of information organization.
- Principles of cataloging and functions of the catalog.
- Metadata: Types, functions, development of metadata schema, metadata used in library settings, hands-on practice in Dublin Core, metadata crosswalk, project examples.
- Relationship between cataloging and metadata.
- Descriptive cataloging concepts such as International Standard Bibliographic Description, Anglo-American Cataloguing Rules, access points, and syndetic structure.
- Process and importance of authority, subject analysis, subject headings (two authority lists), classification systems (two systems).
- Working knowledge of bibliographic networks, OPAC, and MARC.
- Arrangement, presentation, and display of records.
- Treatment of electronic resources using cataloging standards and metadata.
- Hands-on practice in creating cataloging and metadata records, using OCLC or RLG to create MARC records, and OCLC's Connexion or other Dublin Core generation tools to create metadata records.
- Hands-on practice in subject cataloging.

Implementation recommendation:

Depending on the length of an LIS program, some educators may be able to provide students with this level of expertise at their introductory course, while others may prefer to devote a course to the topics recommended here. The main difference between Level I

expertise and Level II expertise is that students with Level I expertise will have an overview of the recommended topics, while those with Level II expertise will have a working knowledge of the recommended topics. Another difference is that Level I expertise is recommended to all students while Level II expertise is intended for students interested in the organization of information. It seems most appropriate to provide students with expertise in organizing electronic resources and metadata in a cataloging course because the specified expertise is related to the cataloging of electronic resources, among other methods of organizing them, and to the understanding of the relationship between metadata and cataloging. But some educators may feel the metadata topics can be examined in other courses such as information systems or subject analysis.

Level III. Expertise for leaders of cataloging and metadata projects

Students with this level of expertise will have the knowledge and skills to assume leadership in managing cataloging and metadata projects. Students aspiring to be cataloging experts are recommended to have competencies in all topics specified below so that they will be comfortable working on cataloging and metadata projects. Students preparing to be metadata experts are recommended to have a good knowledge of cataloging standards and process regarding resources of all formats so that they have sufficient knowledge to select an appropriate metadata scheme to organize these resources.

Objectives: Students with this level of expertise will

- Have a strong command of cataloging standards and practices concerning print, nonprint, and digital resources.

- Know how to utilize a variety of metadata schema such as MARC, Dublin Core, TEI, and EAD.
- Know the strengths and limitations of using cataloging and metadata for controlling resources of any format.
- Understand the history, semantics and structure of at least two metadata schema and their strengths and limitations.
- Possess the knowledge of concept mapping, crosswalks, and interoperability issues.
- Know how to identify areas for metadata development and have the ability to develop metadata sets, implement them, and evaluate their effects on information access.
- Know how to facilitate and coordinate metadata projects.
- Understand the process of implementing a metadata project, including needs assessment, metadata scheme adaptation, project management, and working with partners from various sectors.
- Develop a framework for organizing a digital collection and understand issues that are critical to making a collection accessible remotely.
- Understand database design and DTD design.
- Assess the application of metadata schema in various environments by information professionals (e.g., library setting, publishing industry).

Specific knowledge and skills: It is strongly recommended that students have knowledge of the following topics

Cataloging topics

- Principles of cataloging and their application to Web resources.
- Cataloging of materials of various formats such as sound recordings, videos, and electronic files, including descriptive cataloging and subject analysis.
- Knowledge of popular control vocabulary such as LC subject headings and DDC and LC classification systems.
- Development of a thesaurus and a classification system.
- Various methods for organizing resources.

Metadata topics

- Metadata principles and practicalities.
- Metadata standard development: Principles, process and procedures
- Knowledge of interoperability, crosswalk, and issues related to integrating diverse collections into an information system.
- Selection, design, and evaluation of a metadata scheme.
- Ability to develop guidelines for using a metadata scheme.
- Metadata project implementation process and issues.

Implementation recommendation:

It would be ideal to have two courses dedicated to the development of expertise at this level, including a course on the cataloging of resources in all formats and the applications of metadata in library and non-library settings; and another course on the development, implementation, and assessment of metadata schema. A small number of LIS programs have done this. But the reality is that the length of a master's degree program and the resources of a program will greatly affect a program's ability to offer two cataloging

courses (basic and advanced) and a high-level metadata course. As Sherry Vellucci pointed out, it may be necessary to rely on a number of courses in an LIS program to give students all the knowledge they need to become resourceful cataloging professionals. So it would be reasonable for programs to distribute the topics named above among their courses. For instance, cataloging and metadata applications could be covered in courses similar to advanced cataloging courses, whereas metadata topics could be included in courses on special collections, system analysis, or management of resources in large organizations. One drawback of this approach, however, is that students will need to take many courses to obtain the recommended expertise. Another drawback is existing courses may have already covered many topics; so adding in-depth coverage of metadata may or may not be feasible. These are issues individual programs will want to address.

Taking the expertise issue a step further, if a program is interested in offering students practical experience in using cataloging and metadata to organize information an option is to design a practicum or internship-type project with an agency or to offer a project-based course on implementing metadata (keeping in mind that cataloging is a form of metadata). The goals of such projects would be for students to apply what they know about cataloging and metadata and obtain the knowledge and skills for applying metadata standards and managing metadata projects. Topics such as the following could be used to structure the learning experience:

- Objectives of the collection.
- Intended audience, expected usage: how do we obtain such data?
- Selection of resources for the collection: how is “collection” defined? What are the selection criteria? Who will decide what to include?

- Copyright issues: Will permission be needed? Do archival rights need to be obtained?
- What types of metadata are needed to ensure access, delivery, security, rights management and preservation?
- If several types of metadata are needed for the project, who will create and maintain them?
- Which metadata schema can be adapted for the project? MARC? Dublin Core? Text Encoding Initiative? What issues must be considered in this process?
- If a new metadata scheme is to be developed, how is that done? What issues must be considered?
- Will metadata content be controlled? If so, where will the controlled terms come from?
- How will metadata be encoded? What are the implications for information retrieval? What are the implications for interoperability?
- How will metadata be stored?
- How will metadata be linked to the information objects they represent?
- How will metadata be used for retrieval? How are users affected by metadata?
- Which information system will be used to manipulate and manage the metadata?
- How will the effectiveness of the selected metadata scheme be assessed?

Assuming a laboratory can be set up, hands-on practice of this type is probably best offered in a classroom setting rather than in actual digital projects because projects have their own timelines and contingencies and may not be able to give students the full range of experience they need. In an LIS laboratory setting a class will have the luxury to

consider all the topics to a greater extent, debate options, select the best solutions, and proceed with implementation. Even if the project is not successful, students still learn much from the process. A major barrier to offering such experience in LIS programs is the cost of setting up such a laboratory, in addition to time and resource constraints mentioned earlier. In a recent Delphi study on metadata education it was proposed that LIS programs consider setting up such a laboratory environment collaboratively.[94] It would be interesting to see if LIS programs find this idea desirable and feasible.

Leadership and management competencies

In addition to technical expertise discussed above, metadata catalogers and metadata specialists will need to develop competencies in several areas because the information environment is changing rapidly, the task of organizing information has become more complex than before, and the need for collaboration with librarians and other information professionals has increased. LIS programs not only need to ensure that their curricula provide up-to-date knowledge for library and information science professionals, but also need to convey values of the profession, explain the importance of theory over practice, cultivate a service orientation and help students develop critical leadership and management competencies. Drawing on the literature on competencies,[95, 96] the following competencies are highly recommended to all LIS students, especially to those aspiring to organize and manage information in the future:

Mission and values: Service orientation, ethics, and diversity

The main goal of library information professional is to enable the user to find, obtain, and access information resources to meet their needs. While catalogers and metadata

specialists may not necessarily work with the public, they should always keep in mind the needs of the user. To convey the basic values of the profession educators should introduce students to the history and mission of the profession and highlight how users have affected the way information is organized. In addition, students need to know about users and their information-seeking patterns and know how to make use of such knowledge as one designs services and systems. Students also should have the ability to recognize ethical issues and know how to deal with unethical practices and decisions. Furthermore, they need to have the ability to appreciate diversity and individuality in users and colleagues. These topics can be covered in a number of foundation and management courses and the concepts can be reinforced in courses related to cataloging and metadata to show students the relevance of such values.

Cooperation and collaboration

The library community has a long history of cooperation and collaboration. Such spirit and the skills to cooperate and collaborate with others are critical in the 21st century. By introducing students to consortia, networks, projects and activities of professional organizations, educators will show them the value and the need for cooperation and collaboration. LIS professionals will need to operate successfully in a team environment and have the ability to work independently. They also need to know how to resolve conflicts and how to compromise. Group projects are best for developing skills in this area, but educators need to monitor a group's activities, provide guidance in dealing with conflicts and intervene if necessary so that group projects will not become exercises in futility and frustration.

Communication and interpersonal skills

Empathy, good listening skills and strong verbal and writing skills are critical because LIS graduates will find it necessary to inform superiors and subordinates of project status, share their concerns, or pose questions. Such skills can be developed through writing assignments and class discussions in all LIS courses. Educators can assist students by demonstrating how to listen and respect others' views while presenting different points of view. It will also be important for students to convey their message effectively and efficiently. Because catalogers and metadata specialists often need to communicate with people with little or no cataloging background, they need to have presentation skills and the ability to summarize complex issues on the spot or in writing. These competencies can be developed from class presentation and experience in holding and participating in Q&A sessions.

Problem solving: analytical, creative, flexible

The ability to analyze a problem and find creative solutions has become more valuable in a changing information environment. A firm grasp of theory and principles is essential for achieving the objectives of information organization, while creativity and flexibility will help cataloging professionals develop smart solutions. Being able to think outside the box is more appreciated than ever. Again, through exercises, class discussions and projects educators can show students how to analyze a problem, brainstorm answers with others, interpret rules and find creative solutions. For instance, a project for students to organize resources of various formats will give them opportunities to consider many issues related to the organization of such resources, examine the applicability of cataloging principles and practices, analyze alternatives for organizing information, select

an action plan, and prepare others to implement it. Cataloging and metadata education is the right place for this type of learning to take place.

Managerial skills

Knowledge and skills in analyzing workflow, developing and implementing information policies and procedures, motivating others to achieve objectives, and managing human resources are essential for cataloging information professionals. Students should be encouraged to take a management course to learn about human resources management and budget management. System analysis courses could also help because of their emphasis on workflow analysis. But cataloging educators could provide the most relevant lessons by including mock scenarios for students to practice analyzing workflow and developing guidelines for data entry and quality control. The challenge of course is to find time for these activities in a course that is already crammed with important topics.

Growth and change

Students need to have the desire to grow professionally and the willingness to move with time. Competencies in this area come from an understanding that the LIS field is a growing area where knowledge is advanced quickly, new technology is introduced at fast pace, and new resource formats continue to emerge. In addition to giving students a solid foundation in the field, educators need to show them how to keep up and how to pursue topics of interest. The value of professional education and continuing education should be emphasized and involvement in professional associations encouraged. By giving students the most up-to-date knowledge and being personally involved in activities of professional groups, educators will show students the joy of learning and the value of being part of professional groups.

Recommended changes to LIS curricula and proposed actions

Introductory courses

More than 70% of LIS programs surveyed for the proposal cover cataloging and metadata in required introductory courses. While most of these introductory courses are about information organization or knowledge organization, the topics covered reflect a wide range. Some provide general introduction to cataloging or cursory coverage of metadata, while others treat the introductory courses as "the" cataloging course. Only three of the 61 respondents reported discussing the relationship between cataloging and metadata in the introductory courses. The different intent of these courses results in great variation in coverage and makes it difficult for employers to assume that LIS students who have completed these introductory courses have been exposed to the same concepts and practices. It is therefore recommended that educators arrive at some consensus on the objectives of these introductory courses and on what cataloging and metadata topics the introductory courses will cover. The proposed Level I expertise specifies what students should be able to do and what specific knowledge and skills they should have. It is critical that the relationship between cataloging and metadata be clarified in the introductory course so that all students understand the value of cataloging and metadata and the roles they play in organizing information.

Most educators demonstrate a good understanding of cataloging, but the coverage of metadata at the introductory course level suggests varying knowledge of metadata. It is therefore proposed that an information package, "Metadata Basics," be prepared so that educators will obtain a common understanding of the critical issues that ought to be

covered at their introductory courses. The package can also be used by catalogers and students to educate themselves if they choose to. Details of the package are discussed in the "Proposed actions" section.

In addition, because some survey respondents expressed interest in sharing teaching experience and materials, it is proposed that a moderated listserv be created and a Web site set up for people interested in teaching in the cataloging and metadata areas. The listserv will facilitate communication between educators and encourage exchange of ideas. To reduce influence from the commercial sector, it is recommended that the listserv be maintained in an academic institution and be moderated to filter out irrelevant postings. The Web site will serve as a clearinghouse of teaching resources and resources relevant to cataloging and metadata education. For the same reason cited above, the Web site will also be located in an academic institution or a professional organization's site and will be available only to subscribers to provide some protection of collected resources. Educators will be invited and encouraged to submit teaching materials and lesson plans to the site, and a Website management staff will maintain the site for its coverage and the currency of collected resources. Details of the Web clearinghouse are included in the "Proposed actions" section below.

Cataloging courses

The latest survey found cataloging courses covering similar topics, reflecting a shared understanding of important topics and issues in this area. Typically, descriptive cataloging and subject cataloging theory, practice, and tools are discussed. But educators tend to focus on the cataloging of print resources, with only 51% covering the cataloging of nonprint, non-electronic resources, and 61% of them cover electronic resources. This

means that many of the students taking cataloging courses may not be ready to catalog electronic resources. As for metadata coverage, slightly more than 70% of the educators provide an overview of metadata, but few go beyond the overview. Although educators emphasize the creation of bibliographic records and subject cataloging activities, fewer than 25% of them offer hands-on practice on creating metadata. This means very few students will be able to use metadata to organize information. If the LIS profession is to play a central role in controlling and managing Web resources, cataloging courses will need to change. The two obvious areas for improvement are the coverage of electronic resources and metadata. The proposed Level II expertise specifies several topics students should have a strong command of, including cataloging rules and practices, electronic resources, and metadata. To help educators improve their cataloging courses, a conference will be organized to update their knowledge of the treatment of electronic resources and to explore teaching strategies for covering cataloging and metadata adequately in LIS curricula. Details of the conference are provided in the "Proposed actions" section.

Survey data show that the trend not to require cataloging has continued, and that trend is troubling because all students need to know about how intellectual and physical access to information resources is provided to function well as an information professional. LIS programs should be encouraged to require cataloging so that all students have exposure to a subject that is the cornerstone of the field. While not all students may become catalogers, cataloging principles and concepts can be applied to the organization and management of many resources. It would be helpful for educators to

show students how cataloging principles and concepts can be applied beyond library settings.

Advanced cataloging courses

LIS programs' offerings of advanced cataloging courses have remained stable. All of the respondents cover topics related to subject cataloging in-depth in the advanced course, and 71% focus on the cataloging of non-print resources. But fewer than 40% of them deal with metadata issues, and only 11% discuss management issues. As for the metadata topics they cover, 56% of the respondents show a preference for Dublin Core, and fewer than 32% cover other metadata related topics.

In the latest survey many educators disagree with the statement, "We may want to design two tracks of study, one for students interested in cataloging, and another for those interested in metadata," but endorse the statement, "We need to have some coverage of metadata in cataloging course(s) because both cataloging and metadata are about information organization," revealing a strong interest in treating cataloging and metadata as related topics for all students. While the required introductory courses will provide introduction to cataloging and metadata, LIS programs need to cover metadata in depth in some courses to prepare students for applications of metadata standards. It is fairly safe to assume that catalogers will be expected to take part in projects that involve metadata. It is therefore recommended that at the advanced course level educators should consider placing more emphasis on electronic and digital resources and devote more time to metadata topics so that students have the technical expertise in the investigation and application of current and emerging metadata standards and the ability to lead projects that involve cataloging and metadata.

Coverage of metadata in metadata and advanced metadata courses

While a majority of the programs include a metadata overview in their required introductory course, less than one third of the programs have a course devoted to metadata, and less than 20% of the programs have an advanced metadata course. Few educators of the metadata courses cover important cataloging concepts and issues, and only 40% explain the relationship between cataloging and metadata in their courses. Topics in metadata and advanced metadata courses show great variation from program to program. At this point few LIS programs have covered metadata in-depth and the offering of courses in metadata in many programs seems to depend on the knowledge and interest of the instructors.

To prepare students to lead and manage metadata projects and coordinate metadata use within an organization, a conference on teaching strategies is proposed. Practitioners with experience in the development of metadata standards, the implementation of metadata projects, the management of metadata, and the evaluation of metadata for information organization and retrieval will share their experience with metadata projects and highlight essential knowledge and skills. And they will brainstorm with educators for strategies to provide to students the levels of expertise recommended. Details of the conference are included in the "Proposed actions" section below.

Proposed actions

Current coverage of metadata at LIS programs remains at a basic level and coverage is uneven across programs. Several actions are proposed below to assist educators in providing students with the levels of expertise recommended by this proposal.

Proposed Action 1. Publicizing the levels of expertise and competencies

An announcement should be made of the levels of expertise and leadership and management competencies to LIS educators and practitioners to inform them of our effort, seek comments, and encourage implementation of the recommendations. The objectives are to engage educators in the process of curriculum revision, to generate interest among practitioners and solicit their input, and to signal to educators and practitioners the need for cataloging and metadata professionals.

Proposed Action 2. "Metadata Basics" package

An information package on the basics of metadata should be assembled and placed on the Web for wide distribution. The objectives are to provide educators with a common set of information resources and tools so that Level I expertise can be delivered across LIS programs, and to provide useful resources for students and practitioners to educate themselves if they choose to.

Proposed Action 3. Listserv creation

A listserv will be created for educators and anyone interested in cataloging and metadata education to discuss issues related to teaching and learning. The listserv can be a useful channel to publicize events and developments relevant to cataloging and metadata education.

Proposed Action 4. Web Clearinghouse on Cataloging and Metadata Education

Many Web sites have collected cataloging resources and metadata resources, but no Web sites have been devoted to cataloging and metadata education. It is proposed that such a site be created as a clearinghouse of resources related to cataloging and metadata education. The site should include resources such as instructors' insights on pedagogical

issues, Web tools, lesson plans, exercises, projects, new development and research, and FAQ's. Users will be asked to subscribe to the clearinghouse so that access to resources can be monitored for evaluation and management purposes and subscribers can be informed of new additions periodically.

Proposed Action 5. Teaching Strategies for Cataloging and Metadata Education

A one-day conference should be organized in January of 2004 for educators to share experience in cataloging education, especially how they have integrated metadata topics into their courses. The focus would be on how educators could help students obtain expertise specified at Level II and III.

The conference will have two parts: Part 1, aiming at Level II expertise, will focus on cataloging electronic resources and strategies for incorporating metadata topics into cataloging courses; and Part 2, aiming at Level III expertise, will focus on advanced metadata skill sets and strategies for preparing LIS professionals to become active participants in the development, refinement, and implementation of metadata standards within and outside library settings.

Part 1. Organizing Electronic Resources with Cataloging and Metadata Standards

- **Content**: This half-day program will include 1) an update on rules for the cataloging of electronic and integrating resources, 2) two presentations by educators on integrating metadata topics into cataloging courses, 3) a break-out discussion of strategies to provide students with Level II expertise and 4) reports from break-out groups and identification of critical pedagogical issues.

❖**Potential presenters and discussion leaders**: Jean Hirons, Ingrid Hsieh-Yee, Gertrude Koh, Steve Miller, Kwong Bor Ng, Regina Reynolds, and Jerry Saye.

Part 2. Strategies for obtaining advanced expertise in cataloging and metadata

❖**Content**: The second half of the conference will include 1) two presentations of strategies for teaching the description and management of resources in various formats using cataloging rules and metadata standards, 2) practitioners' perspectives on needed advanced knowledge and skills in cataloging and metadata, 3) a break-out discussion of teaching concerns and strategies and exploration for collaboration among educators and practitioners.

❖**Potential speakers**: Potential presenters: Caroline Arms, Liz Bishoff, Lorcan Dempsey, Rebecca Guenther, Sally McCallum, William Moen, Stuart Sutton, Barbara Tillett, Stu Weibel, NISO representative.

Timeline

Target date	Task
Feb. 2003	Announcement of the levels of expertise and competencies
May 2003	"Metadata Basics" information package available on the Web
May 2003	Listserv created
Sept. 2003	Web Clearinghouse for cataloging and metadata education launched
Jan. 2004	One-day conference on cataloging and metadata education held
May 2004	Report on the implementation and evaluation of the proposed actions
June 2004	Presentation at ALA meeting on the proposed program's implementation and progress
Sept. 2004	Interim assessment of the Web Clearinghouse (a Web survey)
April 2005	Survey of LIS programs on cataloging and metadata education
Sept. 2005	Survey on the impact of the Web Clearinghouse
Sept. 2005	LIS program survey report
Nov. 2005	Web Clearinghouse impact study report
Dec. 2005	Reactions to survey results, strategies for future cataloging and metadata education and plan for the future of Web Clearinghouse
Jan. 2006	Mid-Winter ALA Presentation on progress and future plan

Timetable for Proposed Actions and Tasks

Year	Month/Tasks	Month/Tasks	Month/Task		Month/Task	Month/Task	
2003		**Feb.** **(Action 1)** Levels of expertise & competencies announced	**May** **(Actions 2&3)** "Metadata Basics" posted Listserv created		**Sept.** **(Action 4)** Web Clearinghouse launched		
2004	**Jan.** **(Action 5)** Conference on teaching strategies held		**May** Report on implementation & evaluation	**June** ALA presentation on the May report	**Sept.** Study of Web Clearinghouse usefulness		
2005		**April** Survey of LIS programs on cataloging and metadata education			**Sept.** Impact assessment of Web Clearinghouse LIS survey report	**Nov.** Impact study report	**Dec.** Reactions to the two 2005 surveys
2006	**Jan.** ALA Presentation on progress and future plan						

References

1. Sherry L. Vellucci, "Cataloging Across the Curriculum: A Syndetic Structure for Teaching Cataloging," *Cataloging & Classification Quarterly* 24, no. ½ (1997): 35-59.
2. Jodi Lynn Spillane, "Comparison of Required Introductory Cataloging Courses, 1986 to 1998," *Library Resources & Technical Services* 43, no. 4 (1999): 223-230.
3. Taemin Park, "The Integration of Electronic Resources into Cataloging Instruction in the LIS Curriculum," *Serials Librarian* 41, no. 3/4 (2002): 57-72.
4. Daniel N. Joudrey, "A New Look at US Graduate Courses in Bibliographic Control," *Cataloging & Classification Quarterly* 34, no. ½ (2002): 59-101.
5. Joudrey, 2002.
6. Vellucci, "Cataloging Across the Curriculum," 35-59.
7. Joudrey, 2002
8. Ingrid Hsieh-Yee, "Cataloging and Metadata Education in LIS Programs," a survey conducted in 2002 for the proposal. (manuscript in progress)
9. Arlene G. Taylor, "A Quarter Century of Cataloging Education," in *Technical Services Management, 1965-1990 A Quarter Century of Change and a Look to the Future. Festschrift for Kathryn Luther Henderson*, eds. Linda C. Smith and Ruth C. Carter. New York: Haworth press, 1996. 300-303.
10. Doris H. Clack, "Education for Cataloging: A Symposium Paper," *Cataloging & Classification Quarterly* 16, no. 3 (1993): 27-37.

11. McAllister-Harper, "An Analysis of Courses in Cataloging and Classification and Related Areas Offered in Sixteen Graduate Library Schools and Their Relationship to Present and Future Trends in Cataloging and Classification and to Cognitive Needs of Professional Academic Catalogers," *Cataloging & Classification Quarterly* 16, no. 3 (1993): 99-123.
12. Vellucci, "Cataloging Across the Curriculum," 35-59.
13. Park, "Integration of Electronic Resources."
14. Michael Gorman, "How Cataloging and Classification Should be Taught," *American Libraries 23* (Sept. 1992): 694-697.
15. Lynn S. Connaway, "A Model Curriculum for Cataloging Education: The Library and Information Services Program at the University of Denver," *Technical Services Quarterly* 15 (1997): 27-41.
16. Ingrid Hsieh-Yee, "Organizing Internet Resources: Teaching Cataloging Standards and Beyond," *OCLC Systems & Services* 16 (2000): 130-143.
17. Judy MacLeod and Daren Callahan, "Educators and Practitioners Reply: As Assessment of Cataloging Education," *Library Resources & Technical Services* 39, no. 2 (1995): 153-165.
18. Vellucci, "Cataloging Across the Curriculum," 35-59.
19. Spillane, "Comparison," 223-230.
20. Janet Swan Hill and Sheila S. Intner, "Preparing for a Cataloging Career: From Cataloging to Knowledge Management" (1999). http://www.ala.org/congress/hill-intner.html

21. Michael Gorman, "Why Teach Cataloguing and Classification?" *Cataloging & Classification Quarterly* 34, no. ½ (2002): 1-13.

22. Sheila S. Intner, "Persist Issues in Cataloging Education: Considering the Past and Looking toward the Future," *Cataloging & Classification Quarterly* 34, no. ½ (2002): 15-29.

23. Gorman, "How Cataloging Should Be Taught," 694-697.

24. Connaway, "Model Curriculum," 27-41.

25. Lisa Romero, "An Analysis of Entry-level Cataloging Errors," *Journal of Education for Library and Information Science* 35, no. 3 (1994): 210.

26. Clack, "Education for Cataloging," 27-37.

27. MacLeod and Callahan, "Educators and Practitioners," 153-165

28. Karen M. Letarte et al., "Practitioner Perspectives on Cataloging Education for Entry-Level Academic Librarians," *Library Resources & Technical Services* 46, no. 1 (2002): 11-22.

29. Michelle R. Turvey and Karen M. Letarte, "Cataloging or Knowledge Management: Perspectives of Library Educators on Cataloging Education for Entry-Level Academic Librarians," *Cataloging & Classification Quarterly* 34, no. ½ (2002): 165-187.

30. ALCTS, "ALCTS Educational Policy Statement" (1995), http://www.ala.org/alcts/publications/educ/edpolicy.html

31. ALA Task Force on Core Competencies, Draft report, 2002. http://www.ala.org/congress/draft.html

32. Gorman, "Why Teach"

33. Ellen Zyroff, “Cataloging is a Prime Number,” *American Libraries* 27 (1996): 47-50.

34. Romero, “An Analysis”

35. Ann O’Neill, "Technical Services Education for the Future." *Technical Services Quarterly* 15, no. 1/2 (1997): 7-10.

36. Turvey and Letarte, “Cataloging or Knowledge Management”

37. Ingrid Hsieh-Yee, “A Delphi Study on Metadata: Curriculum Implications and Research Priorities” (presented at the annual meeting of the American Society for Information Science and Technology, Washington, D.C., Nov. 2001; manuscript in progress).

38. Ingrid Hsieh-Yee, “Practitioners’ Perspective on Metadata Education and Research” (manuscript in progress).

39. Debra W. Hill, “Requisite Skills of the Entry-Level Cataloger: A Supervisor’s Perspective.” *Cataloging & Classification Quarterly* 23, no. 3 (1997): 72-83.

40. Taylor, “A Quarter Century”

41. Olivia C. Frost, Library Studies at the School of Information.” *Library Hi Tech* 16, no. 2 (1998): 91-102.

42. Park, 2002.

43. Joudrey, 2002.

44. Ron Chepesiuk, “Organizing the Internet: The ‘Core’ of the Challenge”, *American Libraries* 30, no. 1 (1999): 60-63.

45. Carl Lagoze, "Business Unusual: How 'Event-Awareness' May Breathe Life Into the Catalog?" (2000). Available at http://lcweb.loc.gov/catdir/bibcontrol/lagoze_paper.html

46. "Nordic Metadata Project Final Report" (1998). Available: http://linnea.helsinki.fi/meta/nmfinal.htm.

47. Regina Romano Reynolds, "Partnerships to Mine Unexploited Sources of Metadata." (2000). Available at http://lcweb.loc.gov/catdir/bibcontrol/reynolds_paper.html.

48. Roy Tennant, "The Art and Science of Digital Bibliography," *Library Journal* 123, no. 17 (1998): 28, 30.

49. Carl A. Mandel and Robert A. Wolven, "Intellectual Access to Digital Documents: Joining Proven Principles with New Technologies," *Cataloging & Classification Quarterly* 22, no. ¾: 25-42.

50. Michael Gorman, "Metadata or Cataloging? A False Choice," *Journal of Internet Cataloging* 2, no. 1 (1999): 5-22.

51. Diane I. Hillmann, "'Parallel Universes' of Meaningful Relationships: Envisioning a Future for the OPAC and the Net," *Cataloging & Classification Quarterly* 22, nos. ¾ (1996): 97-103.

52. Oder, "Cataloging the Net," 47-51.

53. James R. Veatch, "Insourcing the Web," *American Libraries* 30, no. 1: 64-67 (1999).

54. Text Encoding Initiative (TEI Home Page). Available at http://www.tei-c.org/

55. EAD Home Page. Available at http://lcweb.loc.gov/ead

56. Dublin Core Metadata Initiative. Available at: http://dublincore.org/

57. Regina Reynolds, "Physical to Digital: Winds of Change" (presented at "Reconceptualizing Cataloging," New Orleans, Louisiana, Jan. 2002). Also available at: http://www.oclc.org/events/videoondemand/symposium/

58. Sarah Thomas, "The Catalog as Portal to the Internet." (2000). Available at: http://lcweb.loc.gov/catdir/bibcontrol/thomas.html

59. Gorman, "Metadata or Cataloging: A False Choice," 1999.

60. C. Jean Godby and R. Reighart, (2001), "Terminology Identification in a Collection of Web Resources," *Journal of Internet Cataloging* 4, nos. ½ (2001): 49-65.

61. Thom B. Hickey, "CORC: A System for Gateway Creation," *Online Information Review* 24, no. 1 (2000): 49-53.

62. Julie Mason and others, "INFOMINE: Promising Directions in Virtual Library Development," *First Monday* 5, no. 6 (June 2000). Available at: http://www.firstmonday.dk/issues/issue5_6/mason/index.html

63. Norm Medeiros, "XML and the Resource Description Framework: The Great Web Hope," *Online* 24, no5 (2000): 37-40.

64. Oingo Meaning-Based Search. Available at: http://www.oingo.com/

65. Carl Lagoze, "Peer-to-Peer Sharing of Metadata" ((presented at "Reconceptualizing Cataloging," New Orleans, Louisiana, Jan. 2002). Also available at http://www.oclc.org/events/videoondemand/symposium/

66. Hsieh-Yee, "Organizing Internet Resources," 130-143.

67. Park, 2002.

68. Joudrey, 2002.
69. Ingrid Hsieh-Yee, "Cataloging and Metadata Education: Asserting a Central Role in Information Organization," *Cataloging & Classification Quarterly* 34, no. ½ (2002): 203-222.
70. ALCTS, "ALCTS Educational Policy Statement"
71. ALA Task Force on Core Competencies.
72. Letarte et al., "Practitioner Perspectives," 11-22.
73. Turvey & Letarte, 2002.
74. ALA Task Force on Core Competencies.
75. Gorman, "Why Teach," 2002.
76. Hsieh-Yee, "Delphi Study"
77. Hsieh-Yee, "Practitioners"
78. William Y. Arms, "Automated Digital Libraries: How Effectively Can Computers Be Used for the Skill Tasks of Professional Librarianship?" *D-Lib Magazine*, 6, no. 7/8 (July 2000).
79. Michael Gorman, "Metadata or Cataloging? A False Choice," *Journal of Internet Cataloging* 2, no. 1 (1999): 5-22.
80. Sarah Thomas, 2000.
81. Hill & Intner, 1999.
82. Michael Gorman, "library schools.com." *California Libraries* 10, no. 7 (2000): 3.
83. Stuart Weibel, "Metadata: The Foundations of Resource Description," D-Lib Magazine (July 1995). Available at: http://www.dlib.org/dlib/July95/07weibel.html

84. Lorcan Dempsey and Rachel Heery, "A review of metadata: a survey of current resource description formats." (March 1997). Available at: http://www.ukoln.ac.uk/metadata/desire/overview/

85. EU-NSF. "Metadata for digital Libraries: a Research Agenda." EU-NSF Working group on Metadata. (March 15, 1999). Available at: http://www.ercim.org/publication/ws-proceedings/EU-NSF/metadata.pdf

86. Gail Hodge. Metadata Made Simpler. Bethesda, MD: NISO Press, 2001. PDF format available at: http://www.niso.org/news/Metadata_simpler.pdf

87. ALCTS, "ALCTS Educational Policy Statement"

88. ALA Task Force on Core Competencies.

89. Turvey & Letarte, 2002

90. Letarte et al., "Practitioner Perspectives"

91. Hsieh-Yee, "Delphi Study"

92. Hsieh-Yee, "Practitioners"

93. ALA Task Force on Core Competencies.

94. Hsieh-Yee, "Delphi Study"

95. Bicentennial Conference on Bibliographic Control for the New Millennium, Topical Discussion Group 2, "What Are the Continuing Education Needs of Professional Catalogers?" (2000). Available at: http://lcweb.loc.gov/catdir/bibcontrol/tdg2.html

96. ALA Task Force on Core Competencies.