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Instructing usability evaluation in LIS curriculum: A case of the U.S.

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Abstract

Increasing use of websites as vehicles for the dissemination of information services in the digital environment and interaction with users has raised many usability concerns in creating user-friendly digital information services. Hence, it is important to understand if and how the future generations of library and other information professionals learn about usability evaluation through their LIS studies. Guided by this research objective, the authors of this paper reviewed the state of usability evaluation (UE) courses in LIS education. The study used content-analysis method to find answers to the research questions. The sample was purposive consisting only ALA accredited schools in the U.S. Publicly available descriptions of the courses on their websites were accessed to review the UE content offered. The content of these identified course descriptions was downloaded and further analyzed in terms of its format and coverage. Besides, based on the experience of the second author, the paper provides insight into both challenges and opportunities that the instructors of usability evaluation courses face. Findings reveal that LIS education programs have not yet fully accepted UE of digital resources as a standard course in their educational repertory. The study suggests that a systematic exposure to UE can place LIS professionals in a better position to communicate with the information technology staff regarding the specific needs of the users and enhance their chances for a productive professional career.

Keywords: Website usability; Usability evaluation; LIS education; USA

Introduction

Since the 1990s, libraries, museums and archives have enthusiastically adopted many digital technologies and are spending significant financial and human resources to create presence in the virtual world through web-based information services. The increasing use of websites as vehicles for both dissemination of information, images and documents in the digital environment and for interaction with users has raised many usability concerns. Thus, the usability of web-based, virtual information resources and services has become an important concern in creating user-friendly digital libraries. Considering the need for creating effective, efficient and accessible virtual environment, libraries have started conducting usability studies of their digital gateways, information sources and services. The literature reports that many libraries conduct in-house usability studies by implementing a variety of usability evaluation methods. Usability studies are also conducted in other digital institutional repositories such as museums and archives. New opportunities for safeguarding and communication of cultural assets, common goals and functions encourage strategic alliances among museums, archives and libraries: collectively also referred to as memory institutions (Glosiene & Manzhukh, 2005).

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Literature reveals that specific methodologies and usability testing techniques are needed to evaluate the unique user interfaces of all kind of memory institutions. While some librarians learn about these usability testing methods through "on the job training," it is important to understand the role of formal LIS education in preparation of the future generations of library and other information professionals for usability evaluation tasks.

Guided by the above research objective, the authors of this paper aimed to review the state of usability evaluation courses in LIS education. The ALA accredited schools in the U.S. were picked as sample considering their role in setting trends in LIS education since late 19th century. Furthermore, the first author was then in the US on Fulbright Post-Doc research in the supervision of the second author, who is a UE instructor and expert. The study aimed to explore the following questions:

Q1. How many LIS schools offer usability evaluation courses?

Q2. What is the format of these courses?

Q3. How specifically is the content of the courses focused on the usability in a library context?

Besides addressing the above questions, the paper also provides insights into both the challenges and opportunities that the instructors of usability evaluation courses face. These observations are based on the second author's experience in teaching a web-based course in usability evaluation at the University of Missouri.

Defining usability

It is generally defined as "the extent to which a product can be used by specified users to achieve specified goals with effectiveness, efficiency and satisfaction in a specified context of use" (ISO.9241-11, 1998). For the purpose of this study the authors adopted Nielsen's following definition. "It is important to realize that usability is not a single, one-dimensional property of a user interface. Usability has multiple components and is traditionally associated with these five usability attributes: learnability, efficiency, memorability, errors, satisfaction" (1993, p. 23). According to him it is distinguished from 'user friendly systems,' Human Computer Interaction (HCI), Computer Human Interaction (CHI), User Centered Design (UCD), and User Interface Design (UID).

Background

A design of a library and information science curriculum that integrates classroom learning with research and practical field experience has been an issue since the Dewey School (Shera, 1972). The same topic continues to attract attention today with addition of new areas of expertise that are relevant for education of future librarians. The overlapping boundaries of librarianship with disciplines such as information science, computer science and communications even further complicate the grasp of what skills are expected from the information professionals in general. Organizationally, many LIS schools have changed into I schools, which also resulted in many drastic changes in their educational programs. The new generations of library and information (LI) professionals are learning how to create, manage and use digital content in a variety of information agencies, such as libraries, virtual museums and archives.

Parallel to these developments there have been ongoing research efforts about the competencies of the 21st century LI professionals and the courses have been added in the educational programs to generate these competencies. The researchers have identified core courses (Irwin, 2002), topic and subtopics of various subjects such as bibliographic instruction (Larson & Meltzer, 1987), business information (White, 2004), and the economics of information (Weech, 1994). Some studies also go even further and analyze the specified readings of the different courses offered in LIS programs. For example, Larsen (1979) reports on the reference sources introduced in basic reference courses and Chan (1987) reports on both the textbooks and supplementary readings used in courses that address cataloging and classification.

The growth of information and communication technologies (ICT) has resulted in design of many digital and virtual library services. As more and more libraries, archives and museums become engaged in digitization, new courses on digital libraries have been added in almost every LIS program in the U.S. Similarly, new and more specialized courses on human-computer interaction, web design and digital resource management have also become common in LIS curricula. However, the research about the coverage and pedagogy applied in this new breed of courses is still emerging. For example, Pomerantz et al. (2006) and Pomerantz (2011) studied the readings assigned in the digital libraries courses that are offered in ALA accredited schools. Another study by Lin and Abels (2010) discusses how a digital library education laboratory is important for fostering active and collaborative learning and for improving digital library education.

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With the raise of digital libraries there has also been a growing concern among librarians about their usability. Battleson, Booth and Weintrop (2001), Hartson, Priya and Pérez-Quiñones (2004), and Comeaux (2008) argue that evaluation is a key for designing library websites that are informative and effective. Also, a literature search performed on May 30, 2010 in the Library, Information Science and Technology Abstract retrieved 23 hits with key terms "usability" and "digital libraries" limited to full-text, peer reviewed publications during 2000 to 2010. The removal of peer reviewed restriction retrieved 33 records. The same search on the Library Literature & Information Science Full Text retrieved only 6 records, however, the number increased to 12 records after removing peer reviewed restriction. It shows that the research literature on the subject is not as huge as compared to other areas.

There is an extensive literature about the usability of library websites, especially about usability tests in individual libraries. The above mentioned articles report case studies on usability evaluation in digital libraries, and the use of various usability evaluation testing methods applied in the evaluation of library websites. The number of online museums is also constantly growing. Glosiene and Manzhukh (2005) emphasize that growing demands on digital services and successful human-computer interaction as an important quality factor brings the field of usability to the memory institutions' professional agenda. The study suggested that usability should become a part of quality management activities in these institutions and that theoretical models that are built around ISO standards may be applied to create a framework for usability management on both strategic and operational levels.

Pallas and Economides (2008) introduced a MUSEF (Museum's Sites Evaluation Framework), a framework for evaluating museums' sites from users point of view, and applied it to evaluate 210 art museums' web sites worldwide. MUSEF is composed from six fundamental evaluation dimensions: Content, Presentation, Usability, Interactivity & Feedback, e-Services, and Technical. The evaluation revealed that most sites needed improvement with respect to interactivity & feedback and e-services. Hyun Hee and Yong Hoo (2008) provided suggestions to improve the usability of institutional repository systems and aimed to establish a usability evaluation framework for heuristic evaluation or formal usability testing of institutional repositories.

In Pakistan, a couple of studies have been conducted on usability of library and information services too. Naz (2007) conducted a study on the use and usability of OPAC of the oldest university library in Pakistan, i.e. Punjab University Library as part her LIS master program under the supervision of the first author. It found out that OPAC needed certain improvements in order to enhance its use and usability. Warraich, Ameen and Tahira (2009) conducted survey to explore the usability of the Higher Education Commission of Pakistan's Digital Library search interface ELIN (Electronic Library & Information Navigator) at the Punjab University, Lahore. The study revealed that a simple majority of the participants was satisfied with the apparent features and inherent features.

Despite the emerging practice of usability evaluation in digital libraries and museums, the LIS literature does not address the status of learning usability evaluation competencies. Therefore, this study aims to explore the current presence and future dimensions of UE courses in LIS education.

Methodology

To answer the questions of the study, the authors first looked for those LIS schools that included UE content in the publicly available descriptions of the courses on their websites. The content of the courses on the topic of UE were identified based on their titles and descriptions. At the first stage, the authors looked for the phrase UE. This practice did not retrieve sufficient results. Hence, it was decided to look into all the courses and identify the ones including at least the concept of usability as a topic or sub-topic. Firstly, those courses were identified that have the phrase "usability" in their title. The number of such courses was too less to go for meaningful analysis. Hence, the inclusion of usability was looked in the catalog description of other related courses such as HCI, User Interface Design, Digital Libraries, and Website design and management. All LIS education programs offer these kinds of courses aiming to give understanding of basic concepts, developing and managing digital library services, designing web or user interface and so forth. The contents of these course descriptions were downloaded for further analysis in terms of their format as well as contents. As a result, the topics related directly or indirectly with usability or UE were identified. The selection of merely those courses was necessary to remain focused and get answers to the questions under study within the confines of the definition chosen for the study.

Some LIS programs offer undergraduate majors or minors, but syllabi were collected only from programs and courses at the graduate level. The authors used the American Library Association's (2010) list of US based Accredited Master's Programs in Library and Information Studies, which contained 50 programs at the time of data collection. Further review of schools' websites revealed that three of them

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have not put course catalog on their websites. Hence, remaining 47 schools' course catalogs were downloaded for detailed content-analysis. The themes were extracted mostly from the course contents.

Data analysis and discussion

The detailed analysis of the courses revealed that the concept of usability was not part of the curriculum in 26 (55%) library schools. The subject was included as main or sub topic in some kind of related courses such as HCI, Info system and architecture and so forth in 17 (36%) schools. Only 4 (9%) schools offer a full 3 credit hour course on usability. Table 1 presents that a significant number of schools still does not address the UE.

Nevertheless, almost every school offers courses on digital libraries, web development, web design, and interface design. These courses mainly focus on constructing and managing digital libraries, web pages and interfaces and address the engineering and content management aspects of developing digital images in libraries' context. Furthermore, the courses on constructing digital archives and museums do not include usability in any context.

Table 1. Status of UE coverage in LIS schools (N = 47)

No coverage identified	Topic/Sub-Topic	Full course
26	17	4

The second question of the study probes about the format of the courses being offered. The analysis of the data presents that it takes two forms:

a) As a full course

Table 2 shows description of the full courses on usability evaluation in four schools.

Table 2. Courses on usability evaluation

University	Course title/description
Florida State University(FSU)	Usability analysis (No details on website)
University of Missouri (MU)	Usability of information systems and services Theories of usability, evaluation methods and techniques, usability engineering lifecycle, usability heuristics, skills for test moderators, using MORAE for usability evaluation, and executing a small UE project
University of North Carolina at Greensboro (UNCG)	Website production and usability for librarians Design, implementation, and evaluation of interfaces for computer systems. User-based techniques, usability issues, and human factors
Simmons College, Boston (SCB)	Usability and user experience research This course covers the conceptual frameworks and applied methodologies for user-centered design and user experience research. Emphasis is placed on learning and practicing a variety of usability research methods/techniques such as scenario development, user profiling, tasks analysis, contextual inquiry, card sorting, usability tests, log data analysis, expert inspection and heuristic evaluation. Rather than a Web or interface design course, this is a research and evaluation course on usability and user experience with the assumption that the results of user and usability research would feed directly into various stages of the interface design cycle.

However, the review of course descriptions revealed that MU and SCB schools' coverage of usability is in generic to various information systems and with high level of the students' practical involvement. Only FSU and UNCG address the subject of usability evaluation with specific reference to library and information services.

b) As topic in other courses

The result of 17 schools courses' review is shown in Table 3. The keywords have been extracted from the courses' titles.

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The details of course contents revealed that they address different aspects of usability. Then, the courses on HCI address interface design and vice-versa. The courses on web design also have information architecture angling of usability. It is interesting to observe that the learning of usability is part of digital library course only in two programs. Table 4 presents some examples of sub-topics from the course descriptions.

Table 3. Usability content in various courses' context with frequencies

HCI=5	Web =5	Info system or architecture=4	Interface =2	DL=2
▪ Indiana ▪ Michigan ▪ Syracuse ▪ North Carolina, CH ▪ University of Texas at Austin	▪ Dominican ▪ Emporia ▪ State U at Albany, NY ▪ St John's University, NY ▪ Drexel	▪ Denver ▪ Illinois, U-C ▪ Maryland ▪ Wisconsin (2 courses)	▪ Illinois, U-C ▪ State U at Albany, NY	▪ Louisiana State ▪ Puerto Rico

Table 4. Course context and coverage of usability as sub-topic

HCI	• "Variables likely to influence the perceived usability" • "Discussion and practice in developing user interface prototypes and performing usability testing" • "Some of the basic approaches to task analysis, design, and evaluation of interactive computer systems"
Web	• Web site management, and design/usability principles • Examines the issues of web usability, accessibility, and web standard compliance • Usability, accessibility, and web standards
Info system or architecture	• Examines the basics of usability, navigation • Engaging users in the process of iterative design, from needs assessment to testing and evaluation • Techniques of usability evaluation
Interface	• Practical interdisciplinary team work in designing, testing, and improving interface • Interface design methods, task and user analysis, user interface evaluation and usability testing
Digital libraries	• User interface, usability and evaluation

It appears that all the 17 LIS education programs introduce just the basic concepts of usability, mostly as a theoretical construct. The authors also noticed that the descriptions of courses on archives and museums included topics such as implications of digitization in memory institutions, but the topic of usability evaluation has not been addressed specifically.

The above findings are based solely on the information collected from the descriptions of courses available on the websites of U.S. LIS programs at the time of data collection. A more detailed analysis involving personal contact with school administrators and course instructors could have presented different information about topical inclusion of UE in LIS education, which was not possible due to the limited time available for the study. However, even such a detailed data collection and analysis would not have changed the key finding of this study that students interested in taking formal, organized courses devoted to UE are presently limited to only few choices.

From UE course offerings in four LIS programs, it is difficult to project how future LIS education will respond to the growing practical interest in UE of digital environments in libraries and other memory institutions. The schools interested in offering specialized UE courses will have to determine their position on four important questions:

1. What is the ratio between conceptual and practical contents in the UE course coverage? The hands-on emphasis in the courses may provide students marketable skills that can be readily applied to new positions.

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2. Should the UE course focus on generic information system usability or should it focus on digital libraries or memory institutions in general? With a broader scope of application the courses may attract students from other disciplines to cross-register with LIS programs.
3. Is it pedagogically feasible to offer UE course in an online format? Flexibility in the format of course offering can attract broader number of interested LIS students and perhaps also non-degree seeking students or alumni.
4. How to define the programmatic overlap between a specialized UE course and other related courses (HCI, Digital libraries, information architecture, and interface design)? If these courses are already fully developed and well subscribed by students, it may be easier to enhance topical presence of UE than to develop a brand new course. Also, short continuing education seminar can be organized to complement the other courses and provide opportunity for hands-on training.

Each LIS program will have to address these issues within its own context, observing especially interests in the professional community, the job market, and available instructional expertise to teach usability evaluation.

Conclusion

The review of literature and LIS courses establish that the LIS education programs have not yet fully accepted usability evaluation of digital resources as a standard course in their educational repertory. While there are various courses related to creating, developing and maintaining the content in digital form, the aspects of usability evaluation as defined in this study are not being addressed. As the growing number of memory institutions is now accessible in a digital form, the need to incorporate the usability education in LIS curriculum will continue to grow. A systematic exposure to UE can place LIS professionals in a better position to communicate with the information technology staff regarding the specific needs of the users of libraries and other memory institutions in all formats, and in this way enhance their chances for a productive professional career. The LIS programs should evaluate the format and coverage of their potential UE courses in their own context and come up with the format and programming structure that ensures the students' success in the emerging market.

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