ARTICLE IN PRESS

The Journal of Academic Librarianship xxx (xxxx) xxx–xxx

Contents lists available at ScienceDirect

The Journal of Academic Librarianship

journal homepage: www.elsevier.com/locate/jacalib

Organization of Materials and Accessing the Library in Blackboard: A Learner-centered Usability Study

Michelle J. Gibeault

University of Arkansas Libraries, Fayetteville, AR, USA

ARTICLE INFO

Keywords:
Learning management systems
Blackboard
Embedded librarianship
Student centered learning
E-learning
Usability standards

Introduction

The ubiquity of Learning Management Systems (LMS) within higher education is hard to overstate. Students often need to use the LMS to manage the coursework for *every* course taken in a given semester. Even if a course is taken on campus and not at a distance, instructors and students share materials, make announcements, interact, and submit assignments via the LMS. Observation suggests that the haste in implementing these comprehensive systems has outpaced consideration of the user's experience. A course instructor can follow many principles of organization to group her materials—by assignment, by week, by material type, by unit—and these choices seem to be made with little guidance or precedent as to what works best for the student. That the student will encounter five or six different courses within the LMS and each course will often use a different system for organizing materials is a phenomenon that seems to be largely unacknowledged. While different methods might reflect reasonable choices from the perspective of the instructor/organizer, the student's experience of several courses can have a cumulative effect that is chaotic, creating a sense of overall disorganization and an overwhelming and negative user experience.

As academic librarians dedicate more of their energies to create learning objects, guides, and other resources to offer within the LMS, there is also potential to leverage our professional training as information organizers, and our expertise with user experience design, to explore best practices for course material organization within the various e-learning environments our students encounter, including the LMS. As educators and researchers, we would do well to be involved in the campus-wide discourse relating to LMS implementation and adoption since the placement, discovery, and use of the materials we create often hinge on user experience patterns which are themselves influenced by these information architectures.

If we put the students in charge, how would they organize their course materials? What would their preferences reflect about approaches to organization? In order to engage with these research questions, a usability study aligned with social constructivist pedagogy and participatory design is described and evaluated as an avenue for investigation. The study entailed a classroom activity in which an adapted card-sort (using Legos) challenged students to organize their course materials, including librarian-created research materials, for their Composition II course's Blackboard site.

Literature review

The literature from several different disciplinary perspectives is useful for framing this research. First, a selected examination of e-learning user interface design and the evolution of the LMS introduces the setting; second, the questions the literature reflects about the involvement of academic libraries in integrating materials and customizing LMS implementation illustrates the need for further research; third, an examination of the relative advantages of the card sort methodology for participatory design offers a rationale for the methods pursued; and, fourth, the *E-Learning Stakeholders' Responsibility Matrix* is introduced to analyze the dynamics which shape LMS user experience and is intended to ground this research as a cooperation-seeking enterprise.

E-mail address: gibeault@uark.edu.

https://doi.org/10.1016/j.acalib.2018.02.008
Received 29 February 2016; Received in revised form 8 February 2018; Accepted 13 February 2018
0099-1333/

Learning management systems as learning spaces

Learning management systems can be used to improve organization of course materials (West, Waddoups, Kennedy, & Graham, 2007), and have been shown to support self-paced learning, greater access to materials (Papastergiou, 2006; Yip, 2004), the development of critical thinking skills (Carmichael & Farrell, 2012), and comprehensively shape the experiences of students (Abdous, 2013). Much has been written about the user interface design of the LMS. These investigations are positioned at the intersection of interface design, human-computer interaction, and pedagogy. In a hallmark work of human-computer interaction, Dix highlighted that accessibility is not enough; users should also be offered the opportunities to structure their experience (Dix, 1993). After internet access reshaped options for education, Harasim (2000) identified a paradigm shift in e-learning design toward trying to achieve all that can be accomplished in a physical classroom within the LMS. Meanwhile, texts like Schuler & Namioka's *Participatory Design: Principles and Practices* helped define participatory design as an extension of social constructivist philosophy and articulated the need for end-user participation in systems design (Schuler & Namioka, 2009).

Nonetheless, in practice, the end-user in the key decision making role for LMS adoption is often the instructor and/or instructional designer. Jarrahi (2010) notes that much less attention has been given to the outcomes of LMS adoption than discussions of their utility. With this idea he grounds a study demonstrating that different groups of professors associate different meanings to a LMS and that these interpretations of meaning along with "factors like discipline of the course, instructors' technical experience, personal concerns about copyright and the impact of other technologies" (p. 268) influence their use. These interpretive indeterminacies are part of the social dimension of the innovation process and an explanation for variation in LMS use.

From the perspective of the learner, or as Sun terms it, the *learner dimension*, a "learners' computer anxiety, instructor attitude toward e-learning, e-learning course flexibility, e-learning course quality, perceived usefulness, perceived ease of use, and diversity in assessment are the critical factors affecting learners' perceived satisfaction" (Sun, Tsai, Finger, Chen, & Yeh, 2008, p. 1196). Other studies have also linked frequency of use as a key to student satisfaction with the LMS (Green, Inan, & Denton, 2012; Menchaca & Bekele, 2008; Palmer & Holt, 2009). However, these findings don't constitute much in the way of optimization; it is hard to think of any system that doesn't become (at least somewhat) more usable, and thereby satisfying, with repetition.

Libraries within the LMS

Jackson (2007) found the necessity of academic library integration within the LMS lacking, and since then, librarians have made significant headway in building bridges into various LMS iterations to strengthen the library's role in higher education (Bell & Shank, 2007; Black, 2008; Black & Blankenship, 2010). As an example, Blackboard is employed for a spectrum of library services ranging from delivering e-reserves to embedding reference service or librarian "online course assistants" (Bielema, Crocker, Miller, Reynolds-Moehrle, & Shaw, 2005, p. 343). Murphy and Black found both librarian assistance at the site level and promotion of course guides during instruction sessions as factors associated with students discovering these library resources within the LMS (Murphy & Black, 2013). However, organization options were not the focus of investigation—these resources were placed within a systematized 'library' which was uniform for all courses within the LMS. Bowen (2012) points out that there is not a consensus on this (or any) strategy: "none of the literature has identified one single best practice for how to present library resources" (p. 453) within the LMS. Ladner, Beagle, Steele, and Steele (2004) and Lillard and Dinwiddie (2004) situate this lack of consensus as a significant gap. Based on a survey of 159 librarians, York and Vance encourage a hybrid approach highlighting the following as best practices of embedded librarianship: "2) Get a Library Link" (in the LMS) and "3) Go Beyond the Library Link" (York & Vance, 2009, p. 203). Gathering data from the student's perspective is a conceivable next-step as librarians evaluate what integration strategies extend beyond library links in the LMS.

Card sorts

Librarians have embraced user experience design—which encompasses the affective and accessibility dimensions of human-computer interaction—for improving our services. Schmidt and Etches (2014) argue that striving toward "useful, usable, and desirable" services (p. 3) involves narrowing and researching user behavior and thinking. Amid a variety of options for research methods, card sorting has developed within user experience design as a strategy for observing how non-experts, the end users of the service, think about categories and content (Spencer, 2009). Faiks and Hyland (2000) pioneered use of the card sort technique to gain insight into the user's point-of-view; they found that card sorting helped avoid presuppositions about organization and inspired confidence in the final design of an online library help service. Task-based testing has served to reproduce and back-up findings of card sort testing (Robbins, Esposito, Kretz, & Aloi, 2007), which can be both qualitative and quantitative (Lewis & Hepburn, 2010; McHale, 2008), and is often simpler (Whang, 2008), less intrusive, and less time consuming approach than other research methods. In order to guide librarians away from common mistakes, Brucker (2010) compiled a series of best practices for pursuing card sorts: avoid jargon; use closed sorts instead of "open sorts" (which leave every choice open to the user); design the card sort relative to the analysis tool that will be used; and, train facilitators in standardized approaches to conducting the sort. The literature presupposes use of cards for the card sort, but since the process focuses on the strategy instead of the object, it makes sense that other objects (like Legos) could be substituted.

Addressing stakeholder concerns through cooperation

Implementation and adoption of learning management systems are prone to the power dynamics and imbalances of their institutional settings. As with library service design, there is a need to balance the priorities of teaching faculty, who have long-term needs (but are often relatively minor in number), with the students', whose perspectives are shorter-term, whose institutional power is asymmetric to that of instructors, and whose needs are harder to pinpoint. Meanwhile, the overarching aim beyond balancing the needs of users is to manage complexity (Lago, Avgeriou, & Hilliard, 2010). In the case of LMS adoption and course development, the creative agency of the educator to design the online course in accordance with their own organization priorities will reflect interpretations of the purpose of the LMS (Jarrahi, 2010), and may be in conflict with a quality user experience for the student.

The international standard for software architecture description provides definitions for the terminology that has since found its way into countless professions outside of software architecture: *stakeholders* are defined as any "individual, team, organization, or classes thereof, having an interest in a system" and *concern* as "interest in a system relevant to one or more of its stakeholders" (ISO/IEC/IEEE, 2011, p. 2). Analysis of multi-stakeholder approaches to balancing conflicting concerns within online learning in higher education is described by the *E-Learning Stakeholders' Responsibility Matrix*, which highlights the interplay between student, instructor, institution, content provider, technology provider, accreditation body, and the students' future employer, and frames them in terms of responsibilities (Wagner, Hassanein, & Head, 2008). Based on literature reviews and a multiple-author feedback methodology, each stakeholder group's motivations and concerns are identified, and actions necessary for cooperation, to address the needs of other stakeholders, are charted. The governing assumption,