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Digital Learning Objects: The California State University System Initiative

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Marci Hunsaker, Shu-Hua Liu, Francis Howard, and Jennifer Davis have all been part-time librarians/faculty at San Jose State University's Dr. Martin Luther King, Jr. Library. During the winter of 2008, Jenny accepted a full-time position at Redwood City Public Library, and Marci has been asked to take a new assignment in the library as Co-Head of Reference Services. Francis and Shu-Hua continue to teach, give reference assistance, and look at new instructional technologies at King Library. Special thanks to Divina Lynch and Mary Somerville for their invaluable assistance in the writing process.

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Abstract

In response to changing teaching and learning circumstances, the California State University System Chancellor's Office (CSU CO) is advancing a Web 2.0-enabled Digital Learning Objects (DLOs) initiative. At the local campus level, academic librarians are concurrently developing a complementary set of online instruction resources. This paper reports on the CSU CO system initiative and, within that context, the San José State University DLO planning process, which promises to enhance the library's suite of virtual instruction services.

California State University Virtual Library: The Vision

The Council of Library Directors (COLD) has crafted a vision of a virtual library for all twenty-three campuses within the California State University (CSU) system. The initiative promises to provide students and faculty with universal access through a single portal to the combined resources of the CSU libraries. Available 24/7 from home, office, library, or anywhere in the world, the virtual library project will ensure that all CSU campus communities have easy access to both digital information resources and also Web-based research consultation and instructional support. As presented in Figure 1, a number of finding aids, digital collections, and instructional services, including Learning Objects, would be available through the CSU Virtual Library's User Portal (CSU Council of Library Directors, 2008).

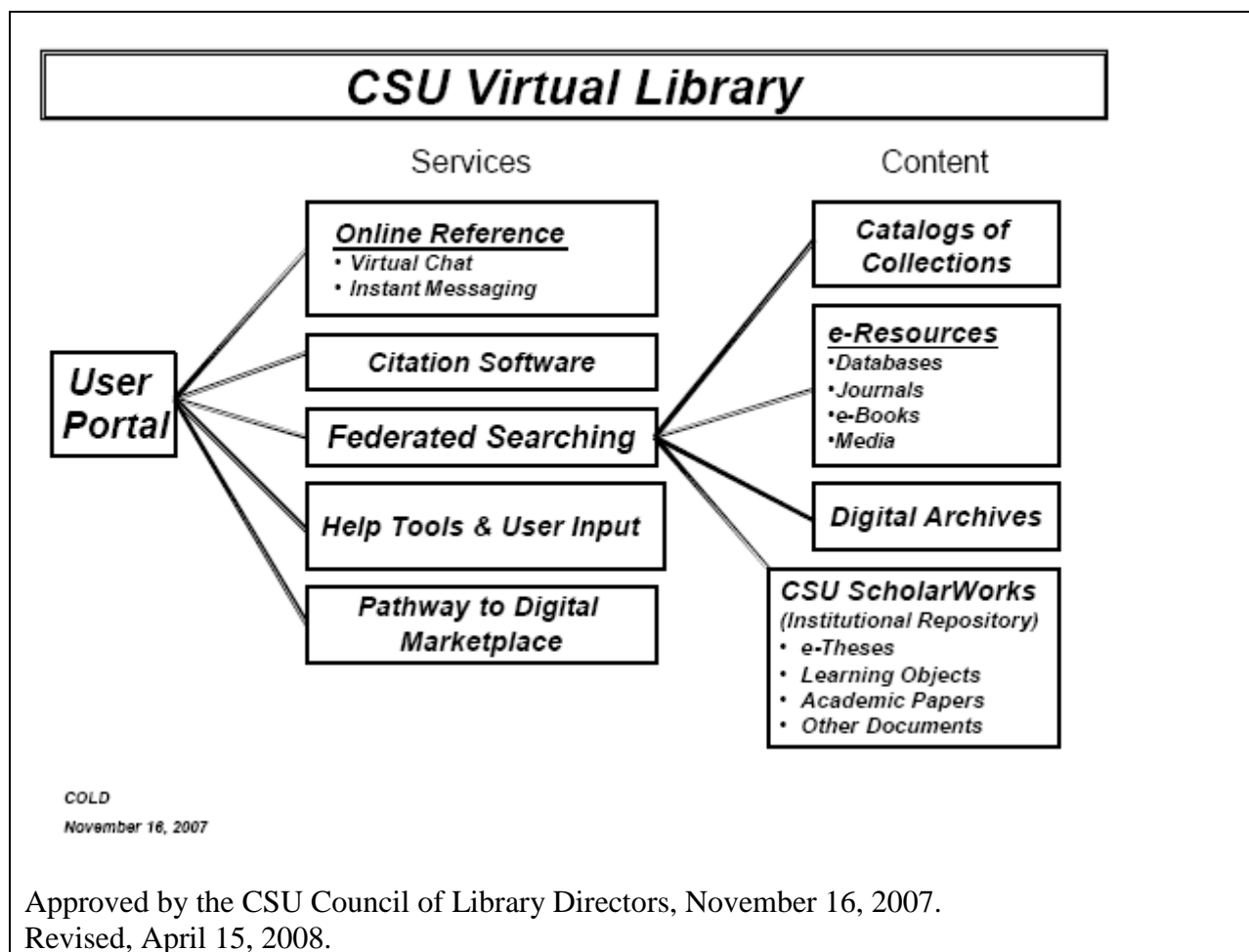


Figure 1. California State University Virtual Library

With guidance from the twenty-three library directors of the CSU Council of Library Directors and leadership from the Manager of Information Literacy Initiatives in the CSU Chancellor's Office, California State University librarians are developing a core set of information literacy Learning Objects (LOs) for system-wide usage. A target implementation date of Fall 2008 informs the R&D efforts to "develop a suite of e-learning activities that can be utilized in multiple learning environments" (Brasley, n.d.). The initial phase focuses on meeting the needs of freshmen level classes on the twenty-three campuses in the CSU system. Following this, upper-division disciplinary needs will be addressed.

Toward these ends, selected campus information literacy coordinators have inventoried and evaluated existing Digital Learning Objects such as tutorials. See Attachment 1 for selected criteria used to determine a collection of high quality LOs, which will become available in Summer 2008. In the process, coordinators discovered that twenty-two of the twenty-three campuses had developed a plagiarism tutorial! This discovery pointed out the potential of this initiative to reduce duplicative campus efforts in addition to raising overall instructional resource quality. Now coordinators are working with professional instructional designers to cooperatively develop content for complementary Web-based instructional resources.

The following scenario, which conveys the user experience envisioned for students by the CSU Council of Library Directors, suggests the multiple roles for DLOs in campus implementations:

Virtual Library Scenario: One Student's Experience

For the research paper in her capstone history course, Debbie signs onto her campus library portal to access knowledge resources. When she signs on, she enters the seamless environment of her campus resources as well as the electronic resources powered by the CSU Virtual Library. This portal authenticates and authorizes her for full access to all licensed resources, including electronic journals and databases, repositories, digital archives, catalogs of the holdings of libraries, learning objects and information research instruction modules. She seeks advice from one of the CSU library faculty members who is a subject specialist in history, asking her question using instant messaging, and gets advice on the best sources for her research, including the CSU History Research Learning Commons. The online catalog of CSU Libraries holdings includes user-generated "tags" and other recommended books associated with individual titles. She retrieves full text journal articles available electronically by clicking on the links in the *America History and Life* database. Debbie then requests other articles not available online by clicking on the document delivery link that automatically fills in the bibliographic information and her own contact information for delivery to her campus library or email address. All the books and articles she selects are automatically entered into a database of citations that can be formatted in any required style for her bibliography. She is especially pleased to find the primary sources she is required to use in the CSU digital archives,

as well as some images to include in her paper. Debbie shares her research experience with other history students in the CSU social networking space (2008).

Within the envisioned information- and resource-rich learning environment, virtual one-on-one research consultation would be supplemented by Digital Learning Objects available for both ‘on demand’ individual usage as well as course-integrated instructional purposes.

Digital Learning Objects: The Basics

The increase in online learning, along with the undeniable need to reach students in venues other than the library classroom, calls for increased variety in the approaches by which academic librarians offer instruction to students. In response, the CSU Chancellor’s Office is advancing a Digital Learning Objects initiative while, concurrently, campuses develop locally relevant DLO products. Digital Learning Objects (DLOs), also referred to as Learning Objects (LOs), have multiple definitions. “Learning Objects evolved out of the object-oriented, reusable code protocols of computer science in the early 1990s” (Metros, 2005, p.12). Most definitions of DLOs include the following key terms: “smaller units of learning,” “self-contained,” “reusable,” “can be aggregated,” and are “tagged with metadata” (Beck, 2007, “One Slightly Lengthier Characterization” section). Essentially, DLOs are digital resources that are used to facilitate learning and can be reused and stored in an electronic repository. Like textbooks, DLOs deliver educational content; however, they tend to be smaller units of learning. According to Wiley, a key scholar of Learning Objects, the fundamental premise behind LOs is that “instructional designers can build small (relative to the size of an entire course) instructional components that can be viewed a number of times in different learning contexts” (2000, p. 3). Wiley also highlights the electronic nature of DLOs, which allows them to be accessed simultaneously by many users and at any time over the Internet.

In the literature of library science, references to Digital Learning Objects are minimal. Grassian (2004) refers to DLOs as one of the ways to reach “technology-focused generation X and Generation Y students” (p. 24) with new instructional tools. Grassian defines DLOs as “reusable electronic teaching/learning items” (p. 25). She points to online, interactive information literacy tools and tutorials such as DLO repository Multimedia Educational Resource for Learning and Online Teaching (MERLOT)—see: <http://www.merlot.org/merlot/index.htm>.

Shank notes that there is much confusion over an appropriate and authoritative definition of learning objects, stating, “This semantic confusion coupled with the debate and disagreement over an agreed upon, concise, and authoritative definition of a learning object makes it challenging to formulate a working definition that librarians can use” (2003, p. 194). Beyond grappling with definition, the author commends the reusable, simultaneous, and ability-to-share characteristics of LOs. He also discusses the importance of LOs to libraries: “Reference and instruction librarians, as information gatherers and disseminators and as educators, should play a vital role in utilizing learning objects to enhance their library and information literacy instruction sessions, in addition to assisting instructors in searching and locating useful existing learning objects” (Shank, 2003, p. 202).

Within the context of the CSU virtual library initiative and, in particular, the information literacy initiative, CSU campuses are now planning to create LOs of local interest. This paper reports on the results to date at the Dr. Martin Luther King, Jr. Library at San José State University.

San José State University: Information Literacy Context

Founded in 1857, San José State University (SJSU) is the oldest public institution of higher education on the West Coast. From its beginnings as a normal school to train teachers for the developing frontier, SJSU has matured into a major urban university offering more than 134-degree programs. With approximately 31,000 students, SJSU is Silicon Valley's largest institution of higher learning. Based in the nation's 10th largest city, the university awards more than 7,000 bachelor's and master's degrees annually. SJSU is also the oldest campus of the California State University (CSU) system, the nation's largest system of higher education.

From its early stages as a normal school, SJSU has developed into a university noted for its "award-winning faculty, high-achieving students, cutting-edge programs and growing collaborations with the community and the corporate world" (San José State University, 2008). Mirroring this ambition, in 2003, a joint library of the City of San José and San José State University was established and formally named Dr. Martin Luther King, Jr. Library (San José Library, 2007, Library History). King Library is the first and largest co-managed academic and public library in the United States. It was awarded "Library of the Year" by *Library Journal* in 2004 for its innovative collaboration and service model (Berry, 2004). A rich array of print and electronic resources, distance learning tools, virtual reference service, and expert professional staff occupy the contemporary eight-story library.

Since opening its doors in 2003, the Dr. Martin Luther King, Jr. Library has committed significant resources and staff to improving students' information competencies. Consequently, under the leadership of former Dean Patricia Breivik, the SJSU Library earned a well-deserved reputation as a leader in information literacy programs. SJSU library faculty members continue to advance the integration of information literacy and information resources into curriculum, from freshmen to graduate level courses. In addition to contributing to campus teaching and

learning priorities, these activities also advance lifelong learning capabilities (Matoush, 2006; Wu & Kendall, 2006; Roldan & Wu, 2004; Hope & Peterson, 2002; Feind, in press). King Library's rich history of innovation and collaboration was underscored and extended in the 2007 strategic plan, which calls for "creatively utilizing innovative technologies to provide the university and the broader community with a 21st Century library environment, both physical and digital" (San José Library, 2007, Intranet).

Implementation of this visionary library goal occurs within the guiding framework of the San José State University 2010 planning document which describes the university as a "prominent student-centered campus" with academic excellence as well as quality scholarship, research, and faculty services (San José State University, n.d., Vision 2010 Section). It follows, therefore, that the digital library initiative urges that innovative Web 2.0 technologies are employed to better serve students, staff, and faculty of the university.

Librarian planners on this student-centered campus recognize that an effective instructional approach must provide services accessible to all students, including long-distance learners with learning style differences and learning-disabled students who require alternative formats of instruction. In all these cases, technology can reach those who are working beyond the physical campus location and can also assist those with diverse learning style needs and preferences. In addition, as one of twenty-three campuses in the California State University (CSU) system, San José State University efforts occur within the context of system level activities that explore Digital Learning Objects as a way to effectively supplement the twenty-three campuses' instructional resource base.

At the Dr. Martin Luther King, Jr. Library on the San José State University campus, appropriate use of Library 2.0 technologies has been both encouraged and enabled (Kendall, Nino & Staley, in press; Somerville & Nino, 2007). In the spring of 2007, all staff members were invited to explore Web 2.0 tools through completion of a fifteen-week online course. Learning 2.0 was a modification of the program designed by Helene Blowers, Technology Director of the Public Library of Charlotte & Mecklenburg County (Blowers, n.d.). The curriculum provided a series of practical exercises of “23 Things” including blogs, wikis, Flickr, RSS feeds, tagging, podcasts, and other Web 2.0 tools. See: <http://sjlibrary23.blogspot.com/>. After learning more about these tools, librarians and staff have been encouraged to use the new skills in their exchanges with library co-workers as well as in their interactions with students and patrons. Many of these Web 2.0 tools are reusable, digital resources which facilitate learning and serve as Digital Learning Objects.

In line with the CSU system framework for developing a suite of online tools to enhance student learning, SJSU is exploring local instructional applications for these technologies. They recognize that, by using Web 2.0 tools and technologies familiar to students, such as iPods for podcasts, DLOs aid “the ordinary user” (Kroski, 2007, p.91) within a diverse multicultural library user population (Partridge, 2007). Librarians and staff members at the King Library are exploring the learning potential of wikis, blogs, RSS feeds, and other digital tools. In SJSU Special Collections and Archives, a blog has been developed for primary source instruction in history, art, and literature-based courses (Moon, 2008). The art librarian has also developed a blog used in conjunction with her information literacy classes (Feind, 2008). Two SJSU librarians worked with campus educational technology staff on a learner-centered collaborative design project (Somerville & Collins, in press). The reference team is exploring the use of short

podcasts for staff training and student instruction. A library database training video has been developed and placed on YouTube (Liu, 2007). Librarians have also worked with the campus Center for Faculty Development to create instructional podcasts. In addition, Elluminate, an online instruction module, has been utilized to host a workshop on Google Scholar. In a concurrent project, the SJSU information literacy coordinator is working with the digital services librarian and a subject liaison specialist to develop a Web-based assessment tool which can be customized to the learning outcomes of specific instructional sessions. In combination, these resources give librarians rich opportunities to forge more robust partnerships with academic faculty, as—together—they explore the effectiveness of information literacy instructional approaches and renegotiate librarians' roles in campus-wide curriculum delivery.

Digital Learning Objects: A SJSU Scenario

In developing local Digital Learning Objects, librarians are inspired by possible scenarios for new partnerships between campus and library faculty. For instance, a campus and/or class wiki is a possible platform for collaborative use by students, faculty, and librarians. The wiki content could include a podcast with basic library instruction which the students can view before their library session. After the library session, students and faculty post questions which stimulate further instructional opportunities via the wiki. A follow-up podcast about the relevance of a specific database to the course assignment could further reinforce the instructional session content. As students develop topics for class papers, they could also develop subject tags to assist each other in exploring topics. In this instance, three DLO technologies—podcasts, tags, and wikis—complement the CSU system-level initiative in providing local “Web-based, interactive, self-contained, reusable learning materials used to support a specific learning objective” (Brasley, n.d.).

Podcasts, “a media file that is distributed over the Internet for playback on personal computers (PCs) and portable media players” (Copley, 2007, p. 387), allow audio feeds to anyone with Internet connections and a digital voice recorder. This quick and easy way of delivering basic information to an audience “is a recent phenomenon on the Internet, which offers academic libraries an alternative channel for communication with faculty and students” (Worcester & Barker, 2006, p. 87). For instance, when librarians are teaching information literacy or library orientation classes, podcasts can serve as an information device, providing basic information such as how to use library resources (Mairn, 2005). Podcasts can also explore topics of interest to students, such as using Google Scholar and “Cool New Web Stuff (what’s out on the Web that can help make research or just plain life easier)” (Griffey, 2007, p. 32). Librarians can then focus on teaching higher-level skills such as effective research strategies.

Podcasts have been recognized as a popular forum (Copley, 2007), and SJSU is developing this tool with an iTunes University site for course and university informational podcasts. “The idea with iTunes U is to expand on its podcasting capabilities and offer those conveniences in technology to the teaching and learning environment” (O’Toole, 2007, p. 941). Because “podcasts may be particularly useful to students with specific learning needs such as dyslexia or dyspraxia, who may require more time for note-taking, or those for whom English is not their first language” (Copley, 2007, p. 396), this technology contributes to the campus universal access commitment.

Tagging is also in line with the campus learner-centered philosophy and universal access commitment. Tagging attaches “descriptive keywords to digital objects for the purpose of future retrieval” (Kroski, 2007, p.91). In generating keywords or categories, a tag can function like a user-created bookmark with a subject keyword (Arch, 2007). The various definitions indicate

that tagging involves several essential elements: the assignment of keywords, a digital environment, and content organization, all for the purpose of information retrieval. There are several reasons that tagging is rising in popularity as a tool for organizing information.

First, tagging breaks the barrier between users and traditional classification schemes. Historically, a controlled vocabulary has ensured authority control for efficiency in information searching, browsing, and indexing. However, the “proliferation of digital libraries and the Web precedes the ability of any one authority to use traditional methods of metadata creation and indexing” (Macgregor & McCulloch, 2006, p. 294). So now “user-added” tags can help in searching for information and accessing the materials more efficiently” (West, 2007, p. 58). Secondly, tagging is a tool for social networking. Users have total control over what they want to bookmark and what keyword they want to choose. Tagging is used “to get exposure and traffic” to Web sites or to assist users in “voicing their opinions” (Morrison, 2007, p. 14). Thirdly, tagging has the advantage of being flexible and current, and tags are easy to create and expand. In the traditional library environment of controlled, hierarchical taxonomy, this type of free-form input is not permissible and changes are extremely time-intensive (Kroski, 2007).

Tagging has been widely adopted in many libraries. For instance, University of Pennsylvania’s PennTags offers quality Web sources bookmarked by faculty, students, and staff. The libraries at Stanford University employ social tagging with an instructional purpose. In the blogs, wikis, and del.icio.us modules (<http://del.icio.us/>), users can find subject information through the use of tags (Arch, 2007). In addition, libraries such as Ann Arbor District Library in Michigan and Queens Library in New York create an open forum to allow users to tag items on the library Web site. The Thomas Ford Memorial Library in Illinois uses Flickr, a photo sharing

network, to tag photos and thereby generate community attention for events such as book sales and speaker forums (Neal, 2007).

At the King Library, Rollyo Web 2.0 tagging software is being explored as a Digital Learning Object. This personalized search engine permits users to share information on up to twenty-five “authoritative and representative” Web sites in a user-friendly site environment (Brandley, 2007, p. 98). In a campus setting, librarians and professors use Rollyo to create subject guides. The tagging feature in the social bookmarking site del.icio.us is also used by students to tag their favorite databases. Not only do students learn from each other by exploring peer-recommended databases but also librarians provide tagging “clouds” of relevant databases.

Popularized by Wikipedia (Lamb, 2004), wikis constitute a third example of the Digital Learning Objects in the group of electronic learning tools for “multiple learning environments,” as suggested in the CSU COLD plan (Brasley, n.d.). Although wikis are often used within libraries for staff collaboration projects such as group research, document sharing, strategic planning, and other intra-office projects, wikis can also serve as a vehicle for involving users in instructional collaborations, thereby demonstrating that “The heart of Library 2.0 is user-centered change” (Casey & Savastinuk, 2006, p. 40). The software allows users to easily create, edit, and link pages together, so wikis (and blogs) are often used for collaboration (Achterman, 2006; Allan, 2007; Atwater-Singer & Sherrill, 2007; Bejune, 2007; Farkas, 2008; Hines, 2007; Huffman, 2006; King & Porter, 2007; Maness, 2006; Matthies, Helmke & Slater, 2006).

In library instruction, wiki collaboration can involve students, librarians, and other faculty members, or the collaboration may occur among the students themselves in preparation for—or after—an instructional session. An excellent example of the librarian-generated approach

occurs in Ohio University Libraries Biz Wiki where business resources, quick research help, featured business articles, online business assignments, and specialized subject guides are presented (Boeninger, 2008). In demonstrating the utility of a wiki for sharing library instruction materials, the Library Instruction Wiki, developed by the Oregon Library Association's Library Instruction Roundtable, provides links to resources such as handouts, tutorials, and other Web sites which might be helpful to "stop reinventing the wheel" (Library Instruction Wiki, 2006). With a similar goal of improving professional practice, Library Success: A Best Practices Wiki shares ideas about using library technology more effectively (http://www.libsuccess.org/index.php?title=Main_Page).

Although the "potential for wikis as an educational tool remains largely untapped" (Achtermann, 2006, p. 19), SJSU librarians are investigating the use of wikis for post library instruction follow-up activities such as student/teacher discussion forums as well as student discussions on blogs or wikis. Librarians and professors can post subject guides and invite students to contribute to class wikis and can also offer podcasts, tutorials, and library resources there. Wikis can be a place for class groups to post papers, calendars, and group action items, as well as to write comments on each of these. In addition, wikis can be a repository for course learning objectives and assessment tools. Wikis can also point to other Digital Learning Objects. Because of the ease of use, 24/7 accessibility, reusability, and adaptability, these Web 2.0-enabled DLO approaches offer fruitful new approaches to learning and instruction.

Conclusion

Wikis, tags, and podcasts offer three promising Digital Learning Objects for reaching students seeking information access in a range of ways and a variety of places. Within the framework of the CSU Virtual Library initiative, King Library planners will continue to explore

local applications for these technologies, increasingly involving campus faculty and student stakeholders in co-creating an information literacy toolkit.

Attachment 1

California State University Digital Learning Objects Criteria (Selected)

Working definition of “INTERACTIVITY”:

- Is more than reading and clicking NEXT to go forward
- Has learner/user controlled navigation instead of being controlled by the developers

Is the tutorial (under review):

- Web based
- Interactive (reviewer to make a note on what sort of interactivity exists)
- Self-contained (i.e., can be modular; the content is self-contained; doesn't have to be in context of larger tutorial to be understood)
- Reusable in other contexts (not overly specific to a certain environment or discipline)
- Offers a specific learning objective that is easily gleaned or understood (reviewer to make a note of each stated or implied learning objective; the student should be able to answer the question: what did you learn)

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