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Curriculum Mapping as a Strategic Planning Tool (post-print proof)

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Strategic Planning and Assessment

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Column Editor's Note. *This column focuses on the closely related topics of strategic planning and assessment in all types of libraries. The column examines all aspects of planning and assessment including (but not limited to) components, methods, approaches, trends, tools and training. Interested authors are invited to submit articles to the editor at wvdole@ualr.edu. Articles on both theory and practice and examples of both successful and unsuccessful attempts in all types of libraries are invited.*

In this issue, Susan Gardner Archambault, Head of Reference & Instructional Services, and Jennifer Masunaga, Reference & Instruction Librarian, Loyola Marymount University, Los Angeles, CA, argue that the curriculum mapping procedure helps libraries integrate their information literacy goals across the curriculum and align these goals with the broader objectives of their institution. The authors review the history of curriculum mapping, present a case study of how it was used in their library, and discuss best practices and tools.

CURRICULUM MAPPING AS A STRATEGIC PLANNING TOOL

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Q1 Color versions of one or more of the figures in the article can be found online at www.tandfonline.com/wjla.

ABSTRACT. *Curriculum mapping is a procedure for documenting and visualizing student learning at the programmatic level. The process allows libraries the opportunity to record where information literacy skills are taught across the curriculum in order to locate gaps and redundancies within a library instruction program. It also allows for alignment of the library's learning outcomes with the learning outcomes important to the institution. This paper presents a review of the history of curriculum mapping, followed by a case study of how Loyola Marymount University (LMU) used the process to support information literacy in a new core curriculum.*

KEYWORDS curriculum mapping, assessment, information literacy, student learning outcomes, higher education, curriculum review

INTRODUCTION

For the last twenty years, institutional and accreditation bodies have focused on student learning, and because of this, the library has been moving "from a content view (books, subject knowledge) to a competency view (what students will be able to do)" (Smith, 2001, p. 32). Libraries can contribute to student success by aiding in the kind of learning that the university values. Collaborating with faculty and university administration to embed information literacy learning outcomes into curricula, courses, and assignments, as outlined in the Association of College and Research Libraries (ACRL) Standards for Libraries in Higher Education (2011), is essential to achieving the academic library's primary goal of developing information-literate learners. How can libraries engage in the institution's curricular development process? The library "must take the initiative in determining what the library has to offer that will help," since it is unlikely to be identified as a place to turn for help otherwise (Smith, 2001, p. 35). Increasingly, academic libraries "seek to integrate information literacy instruction into the curriculum of academic departments within the university" (VanScoy & Oakleaf, 2008, p. 566). Two categories of success articulated in the "Characteristics of Programs of Information Literacy that Illustrate Best Practices: A Guideline" (ACRL "Best Practices Initiative Institute for Information Literacy," 2012) document—"Goals and Objectives" and "Articulation within the Curriculum," both stress that the goals and objectives for information literacy programs be consistent with the mission, goals, and objectives of the library and the institution. Furthermore, information literacy must be integrated across the curriculum through specified programs and courses charged with implementing information literacy competencies.

One procedure that helps librarians do this kind of shared competencies alignment is curriculum mapping. Curriculum mapping is the systematic

analysis of the content of the courses in a curriculum. The original Latin meaning of the word curriculum is loosely translated to mean "the course, the path, the road" (English, 1980, p. 559). Eisenberg (1984) noted that curriculum "defines what is taught, in what order, with what methods and materials, and how it is evaluated" (p. 3). By creating a curriculum map, the structure of a program becomes visible (Bullard & Holden, 2008). Curriculum mapping is a way of examining a program of study and the courses within that program in order to understand curriculum structures and relationships, gain insight in how students experience their discipline, and increase awareness of curricular content. Librarians can "use curriculum mapping to demonstrate how the library's instruction activities intersect with broader campus goals and outcomes" (Belanger & Oakleaf, 2013, p. 355). Ideally, libraries should link their own information literacy learning outcomes to wider learning outcomes at the accreditation, institutional, program, or department level. This will allow librarians to work with faculty to make library instruction "an organic and immersive process, not a one-time effort" (Moser, Heisel, Jacob, & McNeill, 2011, p. 331). This article will review the history of curriculum mapping and explain how it can be used as a strategic planning tool for information literacy instruction.

HISTORY OF CURRICULUM MAPPING

Curriculum Mapping for K–12 Education

Curriculum mapping was developed in the 1970's for primary and secondary teachers. In 1980, Fenwick W. English described curriculum mapping as a way for K–12 teachers to inventory the major concepts (including accompanying skills, attitudes, and activities) taught in their classrooms and the timespan allotted for each major concept on the academic calendar. It allowed for the recording of overlap and variance among teachers teaching similar content. It was described by English (1980) as a "reconstruction of the real curriculum teachers have taught" (p. 558) rather than the old 'top-down' prescriptive approach where teachers were encouraged to "align" their class time to the official district curriculum. Traditional procedures for curriculum development were still supervised by a teacher, evaluator or coordinator; almost all maps went through a third party (Jacobs, 1997, pp. 7–8). In 1984, Michael Eisenberg described a curriculum mapping project done for the New York State Bureau to School Libraries to identify the units in the curriculum most suited for library media center involvement. The mapping was done using a computer-based system called CMAP to allow for data manipulation, and the level of instruction (introduced, reinforced, or expanded) was recorded for each learning objective along with the teaching method, materials used, organization of instruction, and how it was evaluated.

Heidi Hayes Jacobs, now considered a major authority in K–12 curriculum development, greatly expanded upon the concept of curriculum mapping in the late 80's and early 90's by pushing for greater teacher participation in the development process and getting rid of the third party. She saw curriculum mapping not just as a tool for individual teachers, but rather as a way to develop a school-wide interdisciplinary curriculum not based on assumptions from standards but on what teachers were really doing in the classroom and how students were accomplishing the learning (Jacobs, 1997). To Jacobs, the teacher was the designer or composer of the classroom and thus her or his curriculum should be integrated into the learning objectives and purpose of the school (Jacobs, 2004). She felt that curriculum mapping was a way to provide the data needed to develop a meaningful vision for sharpening the alignment of standards, identifying repetitions and gaps in student learning, and creating a consistent core curriculum for all children (Jacobs, 1997). She listed four phases in the curriculum mapping process: (1) laying the foundation (developing a deeper understanding of curriculum mapping and your school's reason to map); (2) launching the process (organizing the structure and orchestrating the mapping); (3) maintaining, sustaining, and integrating the system (including assessment data and literacy skills); and (4) advanced mapping tasks for the future (Jacobs & Johnson, 2009). Ironically, her description of primary and secondary education in the late 90's is applicable to universities in the current day: "(t)hough teachers may work together in the same building for years, they usually have sketchy knowledge of what goes on in each other's classrooms" (Jacobs, 1997, p. 3). Jacobs' best practice recommendations for curriculum map development can be found in academic library literature and is still applicable for current day mappers.

Precursor to Curriculum Mapping: The Syllabus Study

Around the same time period as English, academic librarians were taking a closer look at syllabus analysis as a useful research method for determining course assignments in order to match these up with corresponding library usage. Linda Rambler (1982) used a syllabus study to determine categories of library usage based on class assignments in different colleges and noted that the information gleaned from the ~~syllabuses~~ syllabi would help for decision making in areas such as budget allocation, collection development, library instruction, public service, and personnel assignments. She also looked at the types of assignments requiring library use. She concluded "a syllabus study provides irrefutable information for library administrators to use in planning and development activities directed toward creating a responsive academic library" (Rambler, 1982, p. 159).

In 1985, Sayles argued that syllabus studies would lead to observed gaps in collection development, anticipatory reference, and improved library guides and library instruction. He proposed evaluating courses using the Library of Congress Subject headings. Similar studies hoping to anticipate library-use needs through a syllabus review were conducted by Lauer, Merz and Craig (1989), Bean and Klekowski (1993), and Williams, Cody and Parnell (2004). Dewald (2003) did a syllabus study limited to the field of business and looked at both library use and demand for research. Later syllabus studies shifted the focus to look at the research and instruction skills required in course assignments (rather than merely looking at library resources used or types of assignments). O'Hanlon (2007) used a syllabus review to look at intersections between university and departmental learning outcomes and the library's research skills instruction program, as well as evidence of required outside research and recommended information resources. VanScoy and Oakleaf (2008) analyzed the research tasks required of first-year students to better inform their curriculum-integrated instruction and found that students needed to locate articles, Web sites, and books. Dinkelman (2010) looked at the research expectations for Biology majors, including course objectives and learning goals as well as information literacy assignments and the information resources listed. Boss and Drabinski (2014), who called their project "roadmapping," analyzed syllabi in the School of Business for library use and information literacy outcomes in order to guide outreach to Business faculty. They based their content analysis around the Association of American Colleges & Universities Information Literacy VALUE Rubric (2010).

'Curriculum Mapping' Term Appears in Academic Libraries

In 2001 the term "curriculum mapping" was used in the context of analyzing previous instruction statistics recorded in a Microsoft Access database to see when instruction was occurring in the curriculum to identify gaps and redundancies in curricular areas, identify collaborative possibilities, and align the instructional program with Information Literacy Competency Standards (Martin, Middleton, Nichols, & Wilmes, 2003). Smith (2001) urged libraries to develop their own learning outcomes, possibly by using the *Information Literacy Competency Standards for Higher Education* (ACRL, 2000) as a starting point; he provided examples of sample learning outcomes. Smith (2001) stated "developing a set of learning outcomes will allow libraries to determine the extent to which their interests are aligned with the expectations of other academic communities in the University (p. 34). In the early 2000's, several University libraries, including the University of Illinois at Urbana-Champaign, the University of Windsor in Ontario, Canada, Wartburg College

in Waverly, Iowa, and Ramapo College of New Jersey (Hinchliffe, Mark, & Merz, 2003; Lampert, 2007) began to experiment with "curriculum mapping" in relation to information literacy. Bullard and Holden (2008) presented on curriculum mapping in a science setting at the University of Tennessee and defined curriculum mapping to the library field as a framework to "identify relevant and appropriate placement of information literacy within a course of study or the general education curriculum" (p.17). They highlighted the following benefits to libraries: "it keeps library services relevant to the department and the students, it encourages a similar language for discussing information literacy, it acts as a tool for marketing to departments, and it creates more authentic (point-of-need) learning opportunities for students" (p. 17). They outlined the following steps for curriculum mapping a discipline: review the degree requirements for your course of study; analyze individual courses and identify existing information literacy concepts and areas of weakness; create a draft of a curriculum map showing areas of existing and potential information literacy; request a meeting with faculty with whom you have good relations to share your results and get their feedback; and then begin marketing your ideas to the rest of the department (p. 21).

Lampert (2007) emphasized the importance for libraries to look, during curriculum mapping, beyond the department level to standards "accepted regionally or nationally by professional associations, state standards, or often even accrediting bodies" (p. 101) for better insight into overall curricular and instructional objectives. Several additional libraries have reported on their efforts to use curriculum mapping to enhance information literacy. Moser, Heisel, Jacob, and McNeill (2011) did a mapping project at Oxford College of Emory University by paring down the ACRL Information Literacy Competency Standards into a list of prioritized goals for student learning, then conducting focus groups with faculty to refine the goals. From there, they developed a curriculum mapping worksheet compatible with the WeaveONLINE assessment management system. The UNLV Libraries (2011) used curriculum mapping to do an analysis of department and program curricula to identify courses that represent strategic points for the introduction, reinforcement, and enhancement of their University Undergraduate Learning Outcomes- Library Core. According to Booth and Matthews (2012), the Claremont Colleges Library took a visualization-based approach to curriculum mapping by using the Mindomo software to do concept mapping to depict the path and requirements of a major and identify "how our instruction, outreach, and collection development efforts can be best (re)directed "(p. 6). Bussert (2014) published directions for engaging subject librarians in program-level assessment to map the integration of information literacy instruction across a curriculum using a shared Google Docs Spreadsheet and the peer review approach. She proposed classifying courses into the following three "tiers": courses

where in-person library instruction is currently offered; courses where the instruction is offered through other means such as co-designed assignments or online tutorials; and courses that would be good candidates for library instruction in the future.

CASE STUDY: LMU

Institutional Context

The number one strategic priority for Loyola Marymount University's (LMU) William H. Hannon Library is for every student to achieve standards-based information literacy proficiencies at graduation. The curriculum mapping project at LMU grew out of a need to plan for a comprehensive and sequential library instruction program that could be integrated into a new undergraduate core curriculum. In 2010, LMU's Faculty Senate voted to adopt new University Undergraduate Learning Goals and Outcomes. One of the learning outcomes addressed information literacy; it stated "students will be able to identify information needs, locate and access relevant information and critically evaluate a diverse array of sources" ("The Core at LMU," 2011). This university-level outcome was a catalyst for the development of complementary program-level learning outcomes related to information literacy for the new undergraduate Core curriculum. The new Core was implemented in 2013, and through the LMU Core, students should be able to "collect, interpret, evaluate and use evidence to make arguments and produce knowledge" and also "identify information needs, locate and access information and critically evaluate sources" ("The Core at LMU").

Information literacy concepts are embedded into course-level learning outcomes for three required courses in the new LMU Core (see Figure 1). Information literacy is introduced at the course level in the fall of a student's freshman year during a First Year Seminar course and reinforced in the second semester during a Rhetorical Arts course. The freshman course information literacy outcomes are measured through online tutorials created by LMU librarians, as well as assignments and grading rubrics developed collaboratively by faculty and LMU librarians. Information literacy skills are then enhanced within a student's disciplinary major at least once at the sophomore level or higher through a course that is "flagged" for information literacy. To "flag" a course for information literacy, each Department must submit a proposal that is signed by their Chair and Dean. The flagging process is ongoing, and many Departments are still considering which course(s) to flag. The curriculum mapping process evolved as a way for librarians to help each Department systematically review information literacy across their curriculum in order to determine which courses to formally "flag" for information literacy.

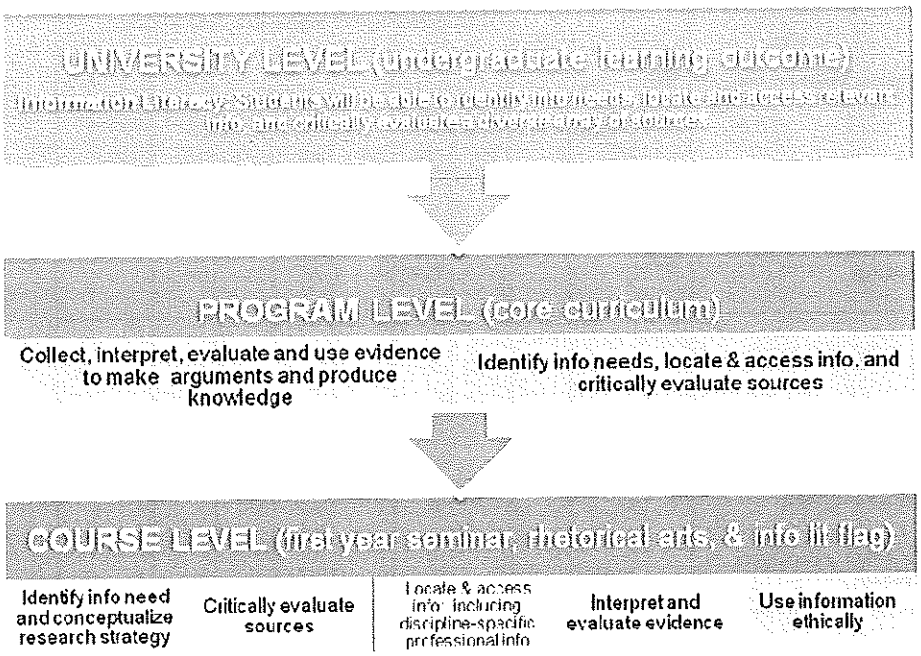

FIGURE 1 Information Literacy Learning Outcomes at LMU.

Design

A set of curriculum mapping instructions and a blank curriculum map template were created for all subject librarians as a Microsoft word document and placed on a shared storage drive. Folders were created on the drive for all 45 subjects or programs of study for undergraduates, with dedicated spaces within each folder to save the curriculum map and the course syllabi. The instructions ask librarians to first make a note of any Departmental learning outcomes or related accrediting body learning outcomes related to information literacy. Then the librarian identifies the required "core" courses within each Major/program of study and lists them on the template as well as the electives. Brief course descriptions are listed, and librarians obtain copies of the course syllabi from the Department in order to perform a content analysis for each course.

A content analysis is performed on each syllabus to identify existing or potential learning outcomes and assignments related to information. A list of five information literacy learning outcomes to look for was created by triangulating the information literacy learning outcomes at the University level, program level, and course levels. Specifically, librarians at LMU are looking for evidence of student participation in the following LMU information literacy dimensions:

INFO. LIT. LEARNING OUTCOME	REQUIRED COURSES/CORE COURSES: Communication Studies										
	FYS	R.A. (replaces 100, 110, 130?, 140)		CMST 170	CMST 203	CMST 204	CMST 351	CMST 352	CMST 451	CMST 452	
Identify info need and conceptualize research strategy	I/E X	X			X	X			X		
Critically evaluate variety of sources	X	X			X*	X					
Locate & access books and articles	X	X			X	X		(X*)	X		
Plagiarism and citing sources	X	X			X	X		X	X	X	
Interpret and evaluate evidence to make arguments		X				X		X	X	X	

FIGURE 2 Sample LMU Curriculum Map.

1. Identify an information need or conceptualize a research strategy (usually through a research topic or thesis)
2. Critically evaluate sources by differentiating between them and using criteria such as rationale/bias, authority, date/currency, accuracy, and relevance
3. Find information beyond assigned course readings (e.g., books and articles)
4. Interpret and evaluate evidence to make arguments by integrating information beyond the assigned course readings
5. Information ethics through the demonstration of proper acknowledgement of others work.

When indicators of these information literacy outcomes are found, they are mapped to the corresponding course(s) on the curriculum map (see Figure 2). The process helps to pinpoint strategic opportunities for librarian-faculty collaborations in "High impact" courses that are required for the Major and could naturally build on foundational information literacy skills taught during the first year. Assessment of the information literacy is also mapped out for each course where information literacy was identified (see Figure 3); librarians record the learning outcomes (what students do); the assignment (how the student demonstrates learning); the curriculum (what does the student need to know to do it well?); and how it is assessed or graded (how we know the student has done it well). The final step asks the librarian to

Course _____CMST 204_____

Information Literacy Learning Outcomes/Performance Indicators (What will the student do?)	**Assignment** (How will the student demonstrate the learning?)	**Curriculum** (What does the student need to know to do it well?)	**How is it Assessed/Graded** (How will we know the student has done this well?)
Identify a research topic or information need Find and use scholarly and discipline-specific professional information Evaluate a scholarly article and understand research method used Select an appropriate documentation style and use it consistently to cite sources Construct well-supported research-based argument	Bibliography Annotated Bibliography Literature Review	Construct search query; Comm Studies Databases to find articles; Evaluate a scholarly article, including the research method uses; Identify research question; Citation Style	"Research Prospectus" consisting of bibliography/source list, annotated bibliography, and Lit Review comprises anywhere between 15-45% of grade

FIGURE 3 Dissection of a Course.

identify courses that should be or could be "flagged" for information literacy (ideally, core courses that by their nature involve research).

Upon completion of each curriculum map, librarians share the results with the Department. The process is helping faculty identify appropriate courses to target for the "information literacy flag" in each college and department and figure out where information literacy fits into their curriculum as a whole. Each librarian recommends courses that are most strategic to embed information literacy instruction into so more students will benefit within each Major. Courses that are required for the Major and could naturally build on foundational information literacy skills taught in freshman core curriculum courses are identified as a top priority (see Figure 4). The curriculum mapping is still underway, but librarians have already successfully persuaded 26 departments (approximately 58% of all departments) to formally embed information literacy into their courses.

CURRICULUM MAPPING BEST PRACTICES

Curriculum mapping through a content analysis of course syllabi is a process that allows librarians to independently gain more control over the subject area they support without requiring a time commitment from faculty or overcoming possible resistance to librarian involvement in teaching. Libraries that perform curriculum mapping can see "where information literacy skills are taught throughout the curriculum ... and locate gaps in student learning as

well as places where instruction is being needlessly repeated" (Moser, 2011, p. 332). However, there are potential roadblocks and ambiguities inherent in the curriculum mapping process that need to be resolved ahead of time to ensure a smoother process. It is best to offer tips for resolving these issues in your planning and initial set of instructions. Here is a list of "best practices" based on our own experience and some experiences discussed in the curriculum mapping literature.

- Multiple sections of the same course can have different learning outcomes and assignments because faculty members may teach the course differently, so be explicit about what to do in these situations. At LMU, we recorded all variations on an assignment or outcome.
- Some courses are cross-listed with multiple departments. For example, the course "Racial and Ethnic Politics" might be listed in both Chicana/o Studies and Political Science. Create a rule for which department is the primary one responsible for doing the mapping in these instances.
- Give librarians access to a list of courses from the library instruction statistics that have requested library instruction over the last two years, since these courses are likely to include information literacy components.
- Align your information literacy learning outcomes to disciplinary or departmental language; the shared language will lead to greater communication between faculty and librarians. Give librarians a document with examples of how the ACRL Information Literacy Competency Standards for Higher Education have aligned with other professional standards. An example of a helpful document showing parallels among different learning standards is

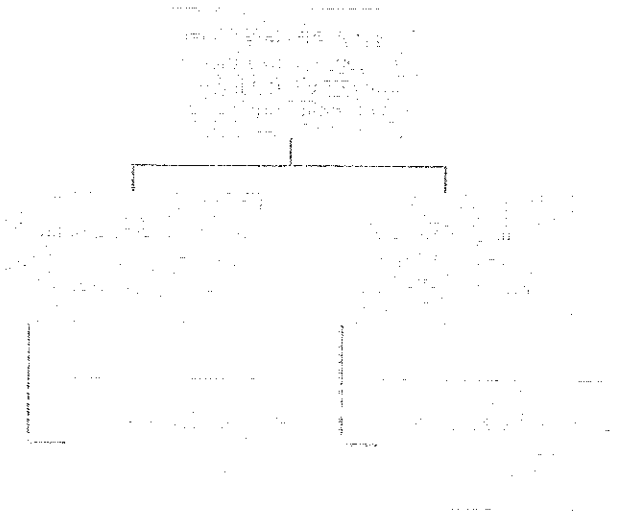

FIGURE 4 Example of Sequential Skills for a Recommended Flagged Course.

Megan Oakleaf's (2011) "Shared Learning Standards and Outcomes" comparison chart (p. 64).

- Exclude courses that are only offered infrequently, or courses that radically change content every time they are taught (e.g., "Special Studies"). These courses are not a priority for information literacy integration, and spending time on them is not strategic.
- There will sometimes be insufficient details on the syllabus. O'Hanlon (2007) notes that "some instructors may distribute separate instructions for research projects" not covered in the syllabus" (p. 181). Therefore, it is a good idea to allow for the option of putting a "?" for instances where information is missing.
- It can be a challenge to collect the syllabi from certain departments, so offer to send someone over to pick up the syllabi (or make photocopies if this is the best option). Send a template form letter that clearly explains the purpose of the curriculum mapping project to both the department chair and the administrative assistant. Have your library dean or director follow up with unresponsive departments.
- "Clearly communicate the goals of the mapping project to librarians so librarians understand the value of engaging in the process and how the desired outcomes can positively impact the instruction program and their own teaching," and be sure to emphasize that the process is "not meant to interrogate individual librarians' teaching loads or pedagogical choices" (Bussert, 2014, p. 148). At LMU, subject librarians had required reading, several presentations, and hands-on practice before they received step-by-step written documentation on how to perform curriculum mapping. It was also added as an activity to the library's strategic plan.

TOOLS FOR CURRICULUM MAPPING

Do-It-Yourself Tools

Curriculum mapping can be plotted in a grid, linear, or "rubric" format. Jacobs (2009) advocated for proactive electronic documentation that could be updated immediately and shared widely (p. 7). One free option is Google Docs, which has collective sharing/editing capacities for map sharing and online cloud storage, and allows users to track changes and revert to earlier versions of their document (Google Docs, 2015). Another inexpensive option is Mindomo for visual concept mapping (Mindomo, 2015). If cloud storage and sharing options are not necessary, Microsoft Office software (e.g., Excel or Word) can be used. There is also specialized curriculum mapping software that can be used to create, organize, analyze and distribute curriculum maps. The majority of software is designed to address the entire process of

curriculum design, implementation and assessment and can do much more than create maps. The software can often search across an entire school district to track outcomes and concepts.

K–12 Software

Mapster was created by the Greater Southern Tier Board of Cooperative Educational Services (GSTBOCES), a non-profit education organization in New York State. It is a Web-based curriculum-mapping tool that requires a JavaScript-enabled browser. Mapster's curriculum maps are based on the model created by Heidi Hayes Jacobs. The product has an online publishing ability that will share maps with other Mapster users. Mapster has tiered pricing based on number of users but ranges from $1,000–3,000 and comes packaged with GSTBOCES' other product, "Toolbox Pro," an e-content management system (Mapster, 2015).

There are several subscription-based (price usually based on district enrollment numbers) commercial software options with a one-time setup fee as well. One option is C2 Collaborative's "Curriculum Mapper," which can be purchased separately or as part of a suite of Web-based curriculum software. It includes fields for "Content," "Skills," "Assessment," and "Standards," the ability for hyperlinks, and can store maps online, create reports, and provide access to lesson plans shared by schools participating in the Curriculum Mapper system (Curriculum Mapper, 2015). School Software Group's "Build Your Own Curriculum" (BYOC) is a similar option. It allows for audio or video attachments and is searchable by keyword or course, unit, topic, learning target, and activity. It allows for comments and lists a "primary in-house expert" for topics (BYOC, 2015). Another Web-based multifunctional curriculum planning tool is EduTect's "UnitPlanner." This tool supports "Curriculum Planning for Understanding," a curriculum development process created by Dr. Jay McTighe, which may be a dissuading factor for those uninterested in this approach (Unit Planner, 2015). EduTect allows for individual school licenses, which may make it a more affordable option than other options in this list. Seacliff Education Solutions offers "Curricuplan," which has less features than some of the others but allows for custom mapping templates, online sharing, and the uploading of state standards (Curricuplan, 2015).

Software for Higher Education

Rubicon International's "Atlas Curriculum Management System" is used in both K–12 and in higher education and is a multifunctional Web-based curriculum management software that supports all aspects of curriculum design,

from tools that assist with standards alignment to online sharing via Web chat and message boards (Atlas, 2015). In addition to creating curriculum maps, Atlas can generate complex analytical reports that filter lesson plans according to state educational standards (such as AAC&U Learning Outcomes), by school or department, professor or theme. Oakleaf, Belanger, and Graham (2013) report that some assessment management systems for higher education can generate curriculum maps. Specifically, they list eLumen, LiveText, rGrade, Taskstream, Tk20, TracDat/iWebfolio, and WEAVEOnline as having this ability (p. 102). LiveText, subscription-based at the institution level, is an e-portolio management software program used to manage student assignments and projects with complex assessment tools and other class management resources. It has Turnitin integration and a curriculum mapping feature, although it is a somewhat simplified version from the model of Heidi Hayes Jacobs. The cost of LiveText is somewhat prohibitive, but many libraries may find that their university already owns a subscription and is using the mapping option for department wide assessment (LiveText, 2015).

CONCLUSION

Curriculum mapping offers many benefits to libraries, including the chance to become more familiar with the curriculum structures and relationships that can align the library's learning outcomes to the rest of the University. The process provides opportunities to systematically review information literacy across all disciplines and forge new faculty partnerships. It helps libraries avoid duplication and gaps in information literacy instruction so that the placement and timing of information literacy across each discipline can become more strategic. Curriculum mapping helps answer the question of what the place is for information literacy in the curriculum as a whole. It leads to a more comprehensive and sequential information literacy program that is better integrated into the institution.

REFERENCES

Association of American Colleges and Universities. (2010). *Information Literacy VALUE Rubric*. Retrieved from http://www.aacu.org/value/rubrics/information-literacy

Association of College and Research Libraries. (2000). *Information Literacy Competency Standards for Higher Education*. Retrieved from http://www.ala.org/acrl/standards/informationliteracycompetency

Association of Colleges and Research Libraries. (2011). *Standards for Libraries in Higher Education*. Retrieved from http://www.ala.org/acrl/standards/standardslibraries

Association of Colleges and Research Libraries, Best Practices Initiative Institute for Information Literacy. (2012). *Characteristics of Programs of Information Literacy that Illustrate Best Practices: A Guideline.* Retrieved from http://www.ala.org/acrl/standards/characteristics

Atlas Curriculum Mapping [Computer software]. (2015). Retrieved from http://www.rubicon.com/AtlasCurriculumMapping_Capabilities.php

Bean, R., & Klekowski, L. M. (1993). Course syllabi. Extracting their hidden potential. *The Off Campus Library Services Conference,* 6th, Kansas City, Missouri, 1–9. Retrieved from http://gcls2.cmich.edu/conference/proceedings.htm

Belanger, J., & Oakleaf, M. (2013). Assessment management systems: Questions to spark librarian engagement. *The Journal of Academic Librarianship, 39*(4), 354–356.

Booth, C., & Mathews, B. (2012, April). Understanding the Learning Experience: Threshold Concepts and Curriculum Mapping. *Invited paper presented at California Academic & Research Libraries Conference*, San Diego, CA . Retrieved from http://www.carl-acrl.org/conference2012/2012ConferenceProceedings.html

Boss, K., & Drabinski, E. (2014). Evidence-based instruction integration: A syllabus analysis project. *Reference Services Review, 42*(2), 263–276. doi:10.1108/RSR-07-2013-0038

Build Your Own Curriculum [Computer software]. (2015) Retrieved from http://www.schoolsoftwaregroup.com/

Bullard, K., & Holden, D. (2008). Hitting a Moving Target: Curriculum Mapping, Information Literacy and Academe. *LOEX Conference Proceedings 2006*. Retrieved from http://commons.emich.edu/loexconf2006/29

Bussert, L. (2014). Marinated in information literacy: Using curriculum mapping to assess the depth, breadth, and content of your embedded instruction program. In K. Calkins & C. Kvenild (Eds.), *The Library Instruction Cookbook* (pp. 145–149). Chicago, IL: Association of College and Research Libraries.

Buzzo, T. (2004). Using communication to solve roadblocks to collaboration. *Teacher Librarian, 31*(5), 28–28.

Curriculum Mapper [Computer software]. (2015). Retrieved from http://c2ready.org/software/curriculum-mapper/

Curricuplan [Computer software]. (2015). Ocean City, NJ: Seacliff Educational Solutions. Retrieved from http://www.curricuplan.com

Dewald, N. H. (2003). Anticipating library use by business students: The uses of a syllabus study. *Research Strategies, 19*(1), 33–45. doi:10.1016/j.resstr.2003.09.003

Dinkelman, A. (2010). Using course syllabi to assess research expectations of biology majors: Implications for further development of information literacy skills in the curriculum. *Issues in Science and Technology Librarianship, Winter(60).* doi:10.5062/F49Z92TJ

Eisenberg, M. (1984, May). Microcomputer-based curriculum mapping: A data management approach. *Paper presented at the meeting of Mid-Year Meeting of the American Society for Information Science*, Bloomington, IN.

eLumen [Computer software]. (2015). Retrieved from http://elumen.info/

English, F. W. (1980). Curriculum mapping. *Educational Leadership, 37*(7), 558–559.

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Google Docs [Computer software]. (2015). Retrieved from www.google.com/docs/about/

Hinchliffe, L., Mark, B. L., & Merz, L. H. (2003). Bridging the gap between information literacy and campus curricula: Using curriculum mapping to achieve a holistic information literacy program. Presented at the *Workshop on Instruction in Library Use (WILU)*, Windsor, Ont.

Jacobs, H. H. (1997). *Mapping the big picture. Integrating curriculum & assessment K–12*. Alexandria, VA: Association for Supervision and Curriculum Development.

Jacobs, H. H. (Ed.). (2004). *Getting results with curriculum mapping*. Alexandria, VA: Association for Supervision and Curriculum Development.

Jacobs, H. H., & Johnson, A. (2009). *The curriculum mapping planner: Templates, tools, and resources for effective professional development*. Alexandria, VA: Association for Supervision and Curriculum Development.

Lampert, L. D. (2007). Searching for respect: academic librarians' role in curriculum development. In S. Curzon & L. D. Lampert (Eds.), *Proven strategies for building an information literacy program* (pp. 95–112). New York, NY: Neal-Schuman Publishers, Inc. Retrieved from http://scholarworks.calstate.edu/handle/10211.2/1996

Lauer, J. D., & Others, A. (1989). What Syllabi reveal about library use: A comparative look at two private academic institutions. *Research Strategies*, *7*(4), 167–74.

LiveText [Computer software]. (2015). Retrieved from https://www.livetext.com/

Loyola Marymount University. (2011). *The Core at LMU*. Retrieved from http://academics.lmu.edu/coreimplementation/thecoreatlmu/

Mapster [Computer software]. (2015). Retrieved from http://mapster.gstboces.org/

Martin, S., Middleton, V., Nichols, J., & Wilmes, N. (2003). Charting instruction: Curriculum mapping for planning and documenting an instructional program. In J. K. Nims & E. Owen (Eds.), *Managing library instruction programs in academic libraries: Selected papers presented at the Twenty-Ninth National LOEX Library Instruction Conference* (Library *orientation series #33)* (pp. 117–120). Ypsilanti, MI: Pierian Press.

Mindomo [Computer software]. (2015). Retrieved from https://www.mindomo.com

Moser, M., Heisel, A., Jacob, N., & McNeill, K. (2011). A more perfect union: Campus collaborations for curriculum mapping information literacy outcomes. *Proceedings of the Association of College and Research Libraries Association Conference*, 330–339. Retrieved from http://www.ala.org/acrl/conferences/confsandpreconfs/national/acrl2011papers

Oakleaf, M. (2009). Using rubrics to assess information literacy: An examination of methodology and interrater reliability. *Journal of the American Society for Information Science & Technology*, *60*(5), 969–983.

Oakleaf, M. (2011). Are they learning? Are we? Learning outcomes and the academic library. *The library Quarterly*, *81*(1), 61–82.

Oakleaf, M., Belander, J., & Graham, C. (2013). Choosing and using assessment management systems: What librarians need to know. *Proceedings of the Association of College and Research Libraries Association Conference*, 97–106. Retrieved from http://www.ala.org/acrl/acrl/conferences/2013/papers

O'Hanlon, N. (2007). Information literacy in the university curriculum: Challenges for outcomes assessment. *portal: Libraries and the Academy*, *7*(2), 169–189. doi:10.1353/pla.2007.0021

Rambler, L. K. (1982). Syllabus study: Key to a responsive academic library. *Journal of Academic Librarianship*, *8*(3), 155–159.

rGrade [Computer software]. (2015). Retrieved from http://www.rgrade.com/

Sayles, J. W. (1985). Course information analysis: Foundation for creative library support. *Journal of Academic Librarianship*, *10*(6), 343.

Smith, K. R. (2001). New roles and responsibilities for the university library: Advancing student learning through outcomes assessment. *Journal of Library Administration*, *35*(4), 29–36.

Taskstream [Computer software]. (2015). Retrieved from https://www1.taskstream.com/

Tk20 [Computer software]. (2015). Retrieved from http://www.tk20.com/

TracDat [Computer software]. (2015). Retrieved from http://www.nuventive.com/products/tracdat/

Unit Planner [Computer software]. (2015). Retrieved from http://edutect.com.au/products/unit-planner/

UNLV University Libraries. (2011). *Libraries Instructional Framework Working Group Report 2011*. Retrieved from http://www.library.unlv.edu/about/instruction_framework

VanScoy, A., & Oakleaf, M. J. (2008). Evidence vs. anecdote: Using syllabi to plan curriculum-integrated information literacy instruction. *College & Research Libraries*, *69*(6), 566–575.

WEAVEOnline [Computer software]. (2015). Retrieved from http://www.weaveonline.com/about-us/

Williams, L., Cody, S. A., & Parnell, J. (2004). Prospecting for new collaborations: Mining syllabi for library service opportunities. *Journal of Academic Librarianship*, *30*(4), 270–275.