

Broadening Boundaries: Opportunities for Information Literacy

Instruction inside and outside the Classroom

Lorelei Rutledge and Sarah LeMire

Abstract: This article proposes that libraries reimagine their information literacy instructional programs using a broader conceptualization and implementation of information literacy that promotes collaborative and personalized learning experiences for students, faculty, and staff, while embracing scalable instruction and reference strategies to maximize librarians' time. We focus on four areas for growth: (1) integrating information literacy across the curriculum, (2) identifying scalable methods to provide information literacy support inside and outside the formal classroom environment, (3) facilitating the creation of personalized learning environments, and (4) engaging students and faculty in social and participatory learning.

Introduction

In her article on the future of libraries, Kelly Miller argues that “universities are increasingly focused on creating high-impact learning experiences” and that “by means of vigorous campus engagement, future-present libraries are identifying these educational priorities and then carefully aligning collections, staff, services, and spaces with them.”¹ Other articles by library futurists have echoed a similar call for developing and supporting high-impact learning experiences, which include such experiences as internships,; undergraduate research, and capstone projects.² These articles suggest that libraries need to broaden their conceptions of how they support the educational missions of their universities, colleges, and communities to provide

more high-quality learning experiences.³ However, creating these experiences requires innovative thinking and a strategic approach in the face of time and budget pressures. To begin this strategic process, we argue for a broader conceptualization and implementation of information literacy that pushes outside the standard library confines of the one-shot or credit-bearing course to encompass ad hoc, unmediated, online, train-the-trainer, and peer-learning approaches. Our vision of information literacy focuses on tailored and individualized learning experiences for groups, bringing together tools, technologies, and communities to create collaborative learning experiences that promote intellectual growth for students, faculty, and staff. To do this, we suggest four areas of opportunity for librarians: (1) integrating information literacy across the curriculum, (2) identifying scalable methods to provide information literacy support inside and outside the formal classroom environment, (3) facilitating the creation of personalized learning environments, and (4) engaging students and faculty in social and participatory learning.

Much of the recent scholarship about library contributions to our universities and colleges, especially with regard to information literacy, has focused on demonstrating a correlation between grade point average and use of library resources.⁴ Other research has concentrated on students' self-perception of their information-seeking skills, showing that students who have taken information literacy classes feel more effective in finding research⁵ and have higher retention rates.⁶ However, learning dispositions, as well as the specific skills and concepts that librarians teach students, are difficult to measure and hard to correlate to retention.

Although correlations between student outcomes and library instruction can be an important tool to help libraries demonstrate value, such research tends to measure information

literacy in the form of library instruction sessions. Focusing on formal instruction alone may cause librarians to miss opportunities to teach information literacy outside of formal interactions, such as reference transactions that occur at outreach events, ad hoc research consultations, or serendipitous conversations across campus. Libraries can demonstrate value not only through resource usage or attendance at an instruction session but also by continuing to integrate information literacy skills across the curriculum to better help students learn and practice discipline-specific information literacy.⁷ Such teaching should continue to emphasize critical thinking skills, an important outcome of good information literacy training.⁸ In addition, expanding our conception of information literacy to encompass moments outside of formal learning opportunities may help us find and develop new opportunities for engaging with students. Likewise, expanding our practices to promote personalized, social, and participatory learning helps us give students new ways to engage with the curriculum.

Developing an extended understanding of information literacy and opportunities to teach it, especially as libraries and library professionals redefine how we provide public services, also requires awareness of the educational and social landscape in which librarians and students teach and learn. Two major trends influencing this landscape have a profound influence on our concept of information literacy: Web 2.0, which denotes the capacities of the Web to enable communication and open sharing of ideas and content; and deep learning, an approach to learning that involves the critical analysis of new ideas, linking them to already known concepts, and using what is learned to solve problems in new, unfamiliar contexts. Some scholars also use the term *Web 3.0* to connote the growing capacity of the Web to permit the automatic generation and sharing of data between machines without human intervention.⁹ Scholars have noted how

Web 2.0 has led to library 2.0, an expansion of the library behind its walls, thereby allowing greater access to resources and expanding the role of librarians teaching information literacy.¹⁰ These recognitions have led to the concepts of pedagogy 2.0, “with the suffix 2.0 characterizing themes such as openness, personalization, collaboration, social networking, social presence, user-generated content, the people’s Web, and collective wisdom, and demarcating areas of higher education where a potentially significant transformation of practice is underway.”¹¹

In the arena of pedagogy, Web 2.0 has encouraged librarians to move beyond a classroom model that focuses on the instructor sharing information with students to one in which students connect with learning resources and with one another via a variety of tools.¹² As Web 2.0 has paved the way for more people to become both consumers and creators of knowledge, Web 3.0 has emerged through participatory technologies that enable learning in a variety of contexts: “Learning is no longer happening solely in the classroom and the divisions between learning, work and recreation are becoming increasingly blurred. Individuals use participatory media to connect with friends, stay informed professionally, and engage with others in learning communities.”¹³ Librarians now have the opportunity and responsibility to help students learn to share, reuse, and remix information appropriately, an idea captured in the concept of “information literacy 2.0,” a redefinition of information literacy that incorporates newly available technologies while recognizing the social and cultural changes that such technologies have influenced.¹⁴

The second trend is the movement in higher education toward teaching by encouraging students to connect their learning in the classroom to skills and ways of thinking they will need in the future outside of the classroom. The 2016 *NMC [New Media Consortium] Horizon Report*

calls for attention to “deep learning,” which involves mastery of subject content as well as “critical thinking, problem-solving, collaboration, and self-directed learning.”¹⁵ The Association of College and Research Libraries (ACRL) Framework for Information Literacy for Higher Education recognizes the importance of deep learning in its use of the term *metaliteracy* to describe “a renewed vision of information literacy as an overarching set of abilities in which students are consumers and creators of information who can participate successfully in collaborative spaces” and who demonstrate “behavioral, affective, cognitive, and metacognitive engagement with the information ecosystem.”¹⁶ In practice, deep learning is reflected by a focus on learning specific habits of mind and understanding, rather than individual skills, and by recognizing that learning, in both the classroom and the professional world, takes place in highly social, collaborative milieus that span disciplinary boundaries.

Information Literacy across the Curriculum

To develop the deep learning skills that students need in their professions, they must understand the ways that professionals in their specific fields search, value, share, and disseminate information. Librarians must integrate information literacy instruction, concepts, and skills across the curriculum and within each discipline to help students learn how their disciplines engage with information. Libraries have taken a variety of approaches to integrating information literacy across the curriculum, including taking advantage of the accreditation process as an opportunity to develop quality enhancement program (QEP) proposals grounded in information literacy or related concepts, such as critical thinking.¹⁷ Another strategy that libraries have implemented is to map their department or college’s curriculum to identify strategic insertion points for information literacy instruction, promoting deep learning of information literacy skills

throughout a college program.¹⁸ By mapping their department's or college's curriculum, librarians can identify the courses in which information literacy instruction can be offered to reach students most efficiently, and they can also maximize their effectiveness by reducing redundant information literacy instruction.

Another common way that librarians implement information literacy across the curriculum is by working with faculty to design curriculum that incorporates information literacy concepts throughout a course in a way that promotes deep learning. In this model, information literacy concepts are not relegated to a single one-shot workshop. Instead, they are integrated into the curriculum to promote deep learning of information literacy and critical thinking skills, which can be applied as a part of discipline-based learning, as well as across different types of classroom experiences. Librarians can facilitate deep learning by getting involved in curriculum development and may even serve as instructors or co-instructors of record for the course. The University of California at Los Angeles (UCLA) Freshman Clusters program and the Freshman Year Experience (FYE) at Sonoma State University in Rohnert Park, California, are both examples of programs in which disciplinary faculty and librarians work together to design curriculum.¹⁹

In cases where external factors interfere with this level of programmatic engagement, librarians can still promote deep learning and build information literacy into the curriculum by providing Web 2.0 technologies to students and departments that facilitate discipline-oriented learning while still promoting information literacy. For example, North Carolina State University in Raleigh worked with several other schools to incorporate technology that would allow students to work together to collect and model data about real-world physics problems, a project

that required them to practice information literacy skills.²⁰ In a similar project, the Massachusetts Institute of Technology in Cambridge implemented the Technology Enabled Active Learning project, where students work in teams to model and simulate their findings, an active learning strategy that leads to more effective learning outcomes.²¹ At the University of Utah in Salt Lake City, one way in which programmatic integration occurs is through librarian involvement on campus online services teams. In this capacity, librarians work with administrators to embed information literacy content into courses using tools such as LibGuides and Web pages in the campus online learning management system that are populated with information about student topics and helpful strategies for finding high-quality information. Through this type of programmatic integration, librarians can embed information literacy concepts and instruction across the curriculum and promote deep learning within the disciplines.

Scalable Models for Teaching and Learning

Many librarians think of information literacy instruction as scheduled, formal interactions, but most libraries lack the capacity to provide in-person instruction to every student at the point of need. To avoid becoming overwhelmed, we need to experiment with scalable tools and models for providing information literacy instruction. One scalable method for increasing information literacy instruction is for librarians to recognize and highlight opportunities for microteaching on campus. Microteaching opportunities are occasions for students to interact briefly with librarians or library resources at the point of need. For example, library reference questions are a small, one-on-one version of information literacy instruction.²² Although many librarians no longer have significant reference responsibilities, they still have a myriad of opportunities to engage in microteaching with students, either one-on-one, in small groups, or via technology. Librarians

can embed snippets of information literacy instruction into even the largest-scale outreach events. At Texas A&M University in College Station, librarians briefly introduce information literacy concepts when addressing first-year student groups. When speaking each summer to incoming members of the university's Corps of Cadets, a student military organization, librarians incorporate information about primary sources into their presentations as just one of many efforts to familiarize first-year students with the complexity of the information landscape.

Librarians also find information literacy teaching opportunities in their everyday activities. Mentoring student organizations or participating in college or university committees can lead to teaching moments both for students and for fellow committee members. Librarians at the University of Utah participate in classes sponsored by the campus Center for Teaching and Learning Excellence, which can lead to opportunities to share information about library resources with faculty. In addition to engaging in person with students and faculty, librarians can provide short tutorials on information literacy concepts and research strategies that students can view on library websites, combined with a phone number or chat window where they can reach out for help. These types of microteaching opportunities already happen but are not often considered information literacy instruction because they are ad hoc, not easily counted, and difficult to assess. However, microteaching opportunities can be profoundly impactful because they occur at a natural point of need for the learner.²³

In addition to engaging in microteaching opportunities, librarians can also promote scalability by working with other educators to help them teach students about information literacy. By developing a network of advocates who can teach information literacy concepts and share information about library resources on the library's behalf, librarians can also promote

information literacy without spending more time in the classroom. Librarians at the University of Kentucky in Lexington successfully implemented a train-the-trainer program with the teaching assistants for an introductory biology lab.²⁴ In addition to increasing the scalability of in-person information literacy instruction, train-the-trainer models give instructors a chance to get their questions about the library answered before they teach students. Librarians at the University of Colorado Boulder reported, “The graduate students’ feedback made it clear that the train-the-trainer program had a very positive impact on both their view of librarians and the necessity of library collaboration.”²⁵ Train-the-trainer models can also be helpful outside the traditional classroom context. Librarians can conduct information literacy training sessions with strategic partners such as campus writing centers to better enable these partners to meet student needs in the moment as well as increase the number and efficacy of referrals to the library for advanced support. The Texas A&M University Libraries share space with the University Writing Center, and writing consultants receive training from librarians to facilitate referrals to library resources or librarians at the student’s point of need.

Another scalable information literacy strategy librarians can employ is peer tutoring, which “typically focuses on a more advanced student helping lower-level students with course content.”²⁶ Many students find that peer tutors provide excellent information literacy and learning support.²⁷ Peer tutors can model good information literacy and student behavior for other students.²⁸ Peer tutoring also provides an opportunity for librarians to initiate the building of information learning networks: “By guiding students who are assisting other students, librarians create an environment where an informal learning community can grow, encouraging students to realize that the library offers more than just a computer station for working on

assignments and checking e-mail.”²⁹ Several libraries have implemented a variation of this model by using students to provide reference, instruction, and other forms of library support.

Libraries have employed student employees to staff reference points for years.³⁰ California Polytechnic State University San Luis Obispo; Grand Valley State University in Allendale, Michigan; and the University of New Hampshire at Manchester all created successful peer reference services.³¹ Librarians at Grand Valley trained students to do basic reference consultations, while librarians at University of New Hampshire trained students to help their peers with research skills.³² Peer tutors can also facilitate more in-depth learning experiences, including information literacy instruction. Peer tutors at the Queen’s University Queen’s Learning Commons in Kingston, Ontario and the University of British Columbia’s Chapman Learning Commons in Vancouver perform a variety of roles, including academic tutoring, writing help, and technical support.³³ Librarians at the University of Colorado Boulder worked to train teaching assistants working with small groups of students from large art lecture courses to provide information literacy instruction, enabling collaborations while at the same time managing the librarians’ workload effectively.³⁴ These types of models are often implemented to free up librarians’ time for other responsibilities,³⁵ but they also can be valuable methods for using peer tutoring as a scalable way to teach information literacy.

Personalized Learning

Another way that libraries can scale instruction efforts and support deep learning of information literacy skills is through technology. Although many libraries use tools such as LibGuides and video tutorials in this capacity, librarians can also explore using Web 2.0 tools to promote personalized learning experiences. In the past, many information literacy efforts focused on a

unidirectional model of learning in which students consumed and evaluated information given to them by the instructor or librarian. However, this model limits opportunities for students to learn to create and organize information in new ways, an important skill in the real world.³⁶ To achieve this type of deep learning, librarians must expand information literacy instruction to incorporate the student as a knowledge creator engaged in a multidirectional relationship with the instructor, librarian, and other students. Librarians need to reconceive of information literacy in a way that takes into account the need for specific skill-based learning in addition to broader dispositions of mind. Libraries can employ a variety of tools in unique configurations to help students build their own personalized learning experiences.

Learning in higher education is increasingly characterized by the learner's ability to create a personalized set of resources, relationships, and educational experiences that are no longer confined to his or her institution.³⁷ Personalized learning also enables students to take control of their learning, encouraging them to "prepare for his/her own learning, take the necessary steps to learn, manage and evaluate the learning and provide self-feedback and judgment, while simultaneously maintaining a high level of motivation."³⁸ Libraries can support deep learning through the development of personalized learning experiences by using technology to help students create personalized learning environments. These environments are "activity spaces in which students interact and communicate with one another and with experts by using loosely coupled Web 2.0 tools, the ultimate result of which is the development of collective learning."³⁹ In most cases, these personalized learning environments function as a space in which instructors can provide resources to students and in which students can share their own materials, thoughts, and connections.⁴⁰ Students or instructors might combine blogs, microblogs, online

course tools, aggregators, and other forms of Web 2.0 technology to create a personalized learning environment.⁴¹ For example, librarians and faculty running the Institute for Research Design in Librarianship, a professional development opportunity for librarians to learn more about how to conduct research, use a variety of tools, including Slack, Facebook, Twitter, Blogger, and Collaborate, to introduce students to course materials and relevant articles about research methods. Participants also use these tools to collaborate with one another and with the institute faculty.

Librarians' goal in helping to create these kinds of tools should be to enable students to take ownership of their own learning experiences. A learning environment for information literacy skills might include a series of self-guided tutorials about how to find and evaluate sources on the course's topic of interest, followed by a collaborative assignment in which students work in a course management system such as Blackboard or Canvas to find and review articles in multiple databases, as well as a group working together to create a brief presentation about their topic to share with other students, who can then share their responses to the presentation via a blog or Twitter. One current example of this kind of personalized learning environment is Coursera, which combines online tutorials with quizzes or learning activities to assess mastery of basic concepts. In most courses, students can enter questions about specific lectures in a wiki-like format, which then creates a question thread to which the other students or the course teachers can respond. Students can also complete writing assignments that their fellow students can comment upon or evaluate.

Librarians play an important role in designing these online educational opportunities by embedding information literacy components into learning materials and helping faculty and staff

make use of Web 2.0 technologies to better serve their students. Bringing together multiple tools such as slide decks, videos, tutorials, and other Web 2.0 tools enables students to learn at their own pace in a rich environment.⁴²

Social and Participatory Learning

Another way that librarians can harness the unique capacities of Web 2.0 tools is to promote students' deep learning through their engagement with one another in social and participatory learning opportunities. Librarians are uniquely poised to show other educators how to take advantage of the interactive, interpersonal, and engaged aspects of learning. One of the outcomes of Web 2.0 and pedagogy 2.0 is the blurring of the distinctions between work and play and between formal and informal learning. This blurring creates many opportunities for students to develop learning dispositions and skills outside of formal classroom instruction.⁴³ Interaction with other students and faculty plays an important role in students' motivation to learn,⁴⁴ including informal interactions such as those that happen before class or via e-mail.⁴⁵ Likewise, students who share information and learn from their peers informally tend to have better grades than those who do not.⁴⁶ Research shows that students learn more effectively when they feel part of a community with which they can engage, either online or in person.⁴⁷ These communities develop on a microlevel when librarians employ collaborative learning techniques in library instruction to encourage students to engage with one another to practice information literacy skills.⁴⁸ On a broader level, the concept of a learning ecology suggests that students learn in a variety of contexts with many people using different tools and that "learning derives from participation in joint activities, is inextricably tied to social practices, and is mediated by artifacts over time."⁴⁹ Given these findings, librarians can take advantage of the social aspects of learning

by helping students create spaces, both in real life and online, where they can engage with information using a variety of both digital and physical tools provided both commercially and through libraries and higher education institutions.⁵⁰

Spaces for Social Learning

One way that libraries can promote social learning is by providing space in the library. Librarians can design spaces for students to meet and engage in group learning. An example of such a space at the University of Utah's J. Willard Marriott Library is the first-floor area housing the library's Browsing Collection. This collection of popular books is kept in the middle of a well-used thoroughfare in the library surrounded by chairs for students to work individually, café-style booths with electrical outlets for group meetings, and whiteboards that permit collaborative work. Clusters of students often surround these whiteboards and cover them with vocabulary lists, math problems, and anatomy diagrams, a highly visible example of how students adapt an informal group-oriented space to engage in collaborative learning.

This type of social learning can also occur virtually, and librarians can collaborate with faculty to develop online social learning spaces. For example, faculty and students can use social networking sites such as Facebook, which can provide unique opportunities for students to share their ideas with one another and to reflect on course-related concepts outside class.⁵¹ Librarians can also provide support for faculty who try to create this sense of community in online classes by providing access to tools that enable connections. For instance, the Marriott Library is exploring the use of Cranium Cafe, a tool similar to Skype that is compliant with the Family Educational Rights and Privacy Act (FERPA) and will allow students to video chat and share documents with one another, with administration, and with faculty members.

Libraries as learning spaces facilitate both formal learning and informal interaction.⁵²

Many libraries have developed comfortable areas that encourage students to linger in the library and work in groups, thereby promoting these informal interactions. Common spaces now featured in library layouts include open concept study areas, group study areas, and high-interaction spaces such as learning or knowledge commons designed to bring together multiple services and tools in one place.⁵³ Some libraries have also developed spaces that stimulate informal student interaction on a particular concept or theme, such as makerspaces. Makerspaces are “designed to allow users to create, build, and learn new projects and technologies.”⁵⁴ These spaces, which can be either permanent or mobile, often have 3-D printers, computers, hardware-store tools, and craft supplies. They allow students to interact with one another, as well as with librarians and faculty members, to create projects without the formality inherent in most in-class instruction.⁵⁵ The University of Tennessee at Chattanooga Library offers support in 3-D printing and project design, as well as access cameras, camcorders, and other tools in its collaborative Studio Space.⁵⁶ The University of Utah Marriott Library makerspace offers access to 3-D printers and scanners, hosts regular workshops on how to use them, and provides support for a variety of software and hardware.

Learning Networks

Another way that librarians can facilitate social and participatory learning is by using their expertise in information literacy and scholarly communication to help students understand how to engage within the formal and informal networks that exist within their disciplines. Learning networks provide a way for students to learn informally by connecting with others with similar

interests and ideas.⁵⁷ Many faculty members participate in the “invisible college,” creating both formal and informal networks to disseminate research and ideas.⁵⁸ These networks

can be professional societies, groups of researchers that gather at annual conferences, scholars from similar disciplines that review each other’s work, research teams focused on one topic, or simply loose collections of researchers from the same or related disciplines who are aware of each other and communicate either formally or informally.⁵⁹

Students may never learn about participating in or developing their own networks during their formal interactions with faculty members in the classroom and the lab. However, these networks can be an important tool, both for learning more about their fields as well as for providing the informal opportunities for interaction that foster student learning. Librarians can aid student access to learning networks by teaching students how to use citation management tools such as Mendeley, Zotero, and EndNote that give students the opportunity to share research with other students and with their faculty members or to follow existing networks in their field. In the University of Utah’s Health Sciences LEAP (Liberal Education and America’s Promise) 1100 and 2004 courses, which are first-year experience courses for students interested in the health sciences, librarians and students share citations with one another, with the instructor of record, and with the embedded librarian using EndNote. This activity helps to introduce students to learning networks and also familiarize them with strategies for organizing their own research, but faculty may need librarian support to get started using this strategy. In a study of how scholars use Mendeley at the University of Colorado Boulder, Alison Hicks and Caroline Sinkinson found that faculty might need more training and support to integrate Mendeley into research collaborations. This finding was echoed by Jenny Emanuel, who found that few

students and faculty take advantage of the collaboration tools in citation management software.³⁹

Helping students learn to use these tools can not only promote better collaboration in the classroom but also provide students with a way to learn how scholars and researchers share information in their respective fields. Learning how scholars and professionals communicate within learning networks helps students gain insights that they can carry into their careers, a hallmark of the deep learning that is the basis for our reimagined conception of information literacy.

Conclusion

As academic libraries seek to redefine public services to better engage students, librarians must expand their traditional conceptualization and implementation of information literacy instruction. The opportunities outlined in this article represent only a few of the possible ways librarians can connect with students to improve students' deep learning of information literacy skills. To take advantage of these opportunities, library administrators and librarians who teach information literacy must create, promote, and maintain support for this expanded vision of information literacy education, taking advantage of both formal classroom and micro-teaching opportunities to engage with students.

By including not just the formal teaching opportunities but also ad hoc, unmediated, online, train-the-trainer, and peer-learning approaches in an instructional program, librarians can reenvision the nature of information literacy instruction. Helping students create personalized deep learning experiences by encouraging their engagement with faculty, librarians, and the library, both in-person and in online spaces mediated by Web 2.0 tools, gives us many opportunities to help students learn to find, use, and create information in service of their

learning goals. Recognizing opportunities to engage both inside and outside of formal learning environments, in-person and online, at students' point of need enables librarians to connect with students even in the face of mounting demands on their time as well as that of the students.

Lorelei Rutledge is an assistant librarian in Faculty Services at the J. Willard Marriott Library of the University of Utah in Salt Lake City; she may be reached by e-mail at: lorelei.rutledge@utah.edu.

Sarah LeMire is the first year experience and outreach librarian at Texas A&M University in College Station; she may be reached by e-mail at: slemire@library.tamu.edu.

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