



## **Information Literacy Interconnections Using a Virtual Learning Environments**

**David V. Loertscher**

and

**Blanche Woolls**

San Jose State University  
San Jose, California, USA

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### **Abstract:**

*In this paper, the various new learning environments available across the world are discussed and their impact on what is known as information literacy as well as the major changes in both how teachers teach and how students learn. The rise of new learning environments alongside the explosive growth of digital information requires every teacher and every learner to rethink everything about teaching, learning, and learning how to learn. A look at this should help the reader make some decisions about information literacy interconnections using virtual learning environments.*

### **Introduction**

For those who are teaching information literacy almost everywhere, the rise of new learning environments during the past decade is almost miraculous. Many of us have lived through this total transformation awestruck by the rapidity of the change. It was not all that long ago that correspondence courses traveled by mail from professor to student and back; the use of amplified telephone and closed circuit television extended our reach. While those systems were amazing at the time, they now appear quaint compared to the high tech learning environments currently available.

For the authors of this paper, the movement into a virtual learning environment began with televised classes meeting at two locations with the teacher alternating the base location for

teaching. As the technology improved and classroom management software became readily available and easier to use, the number of televised classes decreased until classes became totally online.

Many research papers have been written on the advantages of online teaching. Students are usually quite satisfied with the opportunity to study in their homes rather than being forced to move to a different location for one or more years. They believe they have greater choice for personal relevance in the courses they take. They perceive that the knowledge they are gaining is useful. They enjoy the ability to choose when they can study and when they can respond to the class work allowing them to work at their own pace. They find the learning to be both active and authentic, and this type of class allows them to improve their computer knowledge. Many cite the ability to be “invisible” in that they will not be judged on their features, race, body size, or physical disability making it an equal ground for all.

Instructors also feel that this type of instruction allows them to get feedback from every student in the class rather than the ones who, in a face-to-face classroom, volunteer to be called upon to answer. While they must revisit their classes each semester, much of what they have prepared for one class will carry over into the next.

The downside for students is that, in a totally online environment, they meet neither teacher nor classmates in person. All contact is online, e-mail, postings to a course management system or an e-forum. They often have little sense of community, and if they do, they have to create a virtual community via social media. In many situations, students may not have adequate personal computing hardware, software, or fast enough internet connections. Further, if they have few computing skills, they may not have adequate training to carry out their assignments.

### **The Birth of Information Literacy**

The first definition of information literacy appeared in 1974 when Paul Zurkowski recommended to the National Commission on Libraries and Information Science (NCLIS) that a national program be established with the end product, “People trained in the application of information resources to their work can be called information literates. They have learned techniques and skills for utilizing the wide range of information tools as well as primary sources in molding information-solutions to their problems.”<sup>1</sup> He had estimated that 1/6 of the population of the U.S. had any concept of the explosion ahead with access to information and how this might affect both their economic lives and their social lives.

Many organizations and educational institutions took up the concept of trying to help their clientele become information literate. Librarians in academic and school libraries remodeled their library skills instruction to encompass information literacy. By 1998, information literacy was further defined as visual literacy to include the thinking, learning, and expressing oneself with images. Media literacy was taught so that learners could go beyond access to the ability to analyze and finally to produce information for new outcomes. Lastly, computer literacy began as the ability to create and manipulate documents and any data with word processing programs, use of spreadsheets, access to a myriad of databases, and use of a wide variety of other software available. Currently, the term “transliteracy” is being used by some to indicate the widening of skills needed to participate in the current world of technology. The arrival of the World Wide Web made it necessary for the literate person to be able to retrieve information, analyze and manage it making use of it to improve the overall quality of life.

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<sup>1</sup> Zurkowski, Paul G. *The Information Service Environment Relationships and Priorities*. National Commission on Libraries and Information Science, 1974, p. 6.

## **Growth of Online Education**

For the authors of this paper, the breakthrough from teaching through televised classes came with the possibility of attaching documents to email messages and the first free learning management system, Blackboard, we encountered. The day both of us went paperless with our students, the world changed. The moment our library mounted access to digital journals, every previous system of teaching and learning faded into ancient history.

## **Learning Management Systems**

In the past decade, a number of learning management systems (LMS) became available, and they keep getting more and more sophisticated year after year. These computer systems provide a digital home for the teacher's content, assignments, discussion boards, and the management tasks of monitoring, assessment, and control of either courses or individual lessons asynchronously. Thus a lesson or course can be available to any student around the world who can interact and work at any time of the day or night. Location and time become irrelevant if the student meets the deadline for discussion or submission of work. Convenience is paramount and can be very successful as long as both the student and teacher have a good connection to the Internet. Indeed, all the professors of the online Master's degree in library and information science at San Jose State University use D2L as their choice of a LMS and the School currently has students in all fifty U.S. states, most Canadian provinces, and in many other countries.

In a LMS, the information environment can be totally self-contained or it can require students to reach out to the Internet and/or libraries for content needed for the course. Typically, the teacher or professor can provide almost everything the student needs in the way of content through online lectures, e-texts, and digital access to periodical articles. Or, the teacher can construct a bare outline of content and require students to go outside the LMS to find appropriate information. In the first instance, while a few information literacy skills are taught, any instruction that expands beyond "a few" becomes possible as access to outside information increases. At San Jose State, the library liaison from the Martin Luther King Library often becomes "embedded" in a course and provides access, tutorials, and some consultation as requested by the various professors. The concept of having the librarian embedded in a particular course as a real time resource, while possible, is only just becoming a "normal" practice when collaborative ties are created.

In some LMSs, the research process part of information literacy should be expanded to include technology skills, techniques for quality discussions on discussion boards, and collaborative group skills especially when the group is distributed across the world and must do all their work via social media or "rooms" inside the LMS. Jointly created products and how they were created as well as examples of how to share become among the other new skills common to many classes inside the LMS.

One of the drawbacks to the LMS is the built-in top-down behaviorist teaching method. With this method, the assumption is that the teacher will hold complete responsibility for the course, will dictate assignments, will create the rubrics, will be testing at various intervals and will generally be "in command" of the entire learning experience. This structure is assumed the minute the teacher encounters the system and what components appear on the first page of the site. So while the major advantages of location and time are erased, traditional pedagogies are assumed. If the instructor is creative with a more constructivist approach hoping to allow the student to acquire and test new knowledge, then one has to work around the system to do experimental instructional designs. For students in LMS environments, self-motivation is a key

behavior, and since few students are now pursuing their education full time, work and life issues remain. Learners often trade the comradeship of the face to face classroom with a different community structure in virtual space. Some like it; others put up with this barrier because of convenience.

In the last decade, a plethora of new learning environments have become possible and with them new challenges and opportunities to improve the acquisition of content knowledge by using new learning with how to learn tools. Looking back to the days with only face to face teaching and learning, your authors, like many others, have participated in the rise of digital tools and online learning. The information literacy models, emerging in the 80s and 90s,<sup>2</sup> were incorporated into the various assignments where outreach into the world of printed information could help build deeper understanding because students were learning new techniques and skills. This wide range of information tools and the use of primary sources helped them, as Zurkowski predicted, to mold information-solutions to their problems. The key became faculty moving toward constructivism.

### **Moving Toward Constructivism Using the LMS and Innovative Tools**

Constructivist instructional designs lead teachers and students toward flatter network learning communities and project-based learning. Using this strategy, teachers guide rather than dictate what is to be done; students come into the command of their own learning rather than completing assignments designed by the instructor. The recommended solution to this new direction for teaching and learning has been two-fold.

The first approach is to use a technology such as “Blackboard Collaborate”, “Go to Meeting,” or “Adobe Connect” to hold synchronous project work sessions supplemented by the LMS where the structure, monitoring, and assessment takes place; and projects are created by the learners. Such a blend of technologies allows teacher and learners to sidestep the top-down class structure in favor of workshops where small and large groups are planning, creating, discussing, solving, and building collaborative intelligence in real time while being dispersed geographically. The usual rigid structure of learning gives way to a variety of options that facilitate the particular problem to be solved or the project being constructed. The major disadvantage is the rigid time schedule when students are strung from Europe across the North American continent and on to the countries of Asia. A class held at 6pm Pacific time in the U.S. allows for fairly easy meeting times across North American and is in the morning hours in Asia. It is those in Europe who suffer strange class hours in the middle of the night if they wish to attend.

In our experience, this first blended approach raises the stakes on how much can be learned by both individuals and collaborative groups in the same three-month semester time frame. At the same time, the level of learning “how to learn skills” must be boosted as students encounter a new technology, new group collaborative skills, and more complex collaborative project possibilities. Project-based learning throws the students automatically out into the world of information so that the information literacy skills required grow exponentially.

A second method of a blended approach we have used is to abandon the LMS technology but to substitute collaborate Web 2.0 tools that are free. The LMSs are expensive and this

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<sup>2</sup> The first information literacy model was created for the British Museum in 1981 by Michael Marland followed by the Pitts and Stripling model in 1988 and the Eisenburg/Berkowitz model in 1989. For a history of these models, see Loertscher, David V. and Blanche Woolls. *Information Literacy: a review of the Research*. Hi Willow Research \* Publishing, 2002. Available from <http://lmcsource.com>

substitute method bypasses those costs. In this scenario, the workshop using “Blackboard Communicate” or other technology is no longer the heart of the course with a number of tools used to create whatever structure is demanded by the project at hand.

For example, using the full suite of tools in “Google Apps for Education” on a Google Site or other web construction tools provides the course structure and a free grading program such as “Engrade” to assess the various projects that constitute the course requirements. Students in this learning environment learn to use a wide variety of communication, collaboration, construction, and management resources to guide themselves and their fellow students toward the building of personal expertise and collaborative intelligence. Here is where the traditional world of information is challenged; suddenly, a wealth of technology tools become available for the world-wide information environment of the Internet making it more efficient to accomplish the task at hand.

### **Example #1:**

While this new, flat networked environment may frighten some students, it provides opportunities for growth in learning skills as well as content understanding in ways not possible in the tighter top-down LMSs currently configured. This will be discussed in the next section but perhaps two examples here will illuminate the possibilities. The first is in a university level class where students who will go into school libraries in basic education programs learn new ways to teach. The second describes an academic librarian embedded with faculty in an English class.

In an instructional design class, groups of students prepared to transform kindergarten through high school learning experiences into high-level designs where information literacy skills for the 21<sup>st</sup> Century are embedded in such a way that deepens content learning. These “transformations” are collaborative units designed by a classroom teacher and teacher librarian. One of the requirements for these Master’s students is to collaboratively design assessments that look at content learning and also assess the embedded 21<sup>st</sup> Century Information Literacy Skills. After all of their units had been constructed and graded, the entire class used a Blackboard Collaborate workshop, and copied all the assessments dealing with content learning into a column of the Google Spreadsheet; and all the assessments of Information Literacy Skills were copied into a second column of the spreadsheet. Together, the class developed criteria on a rating scale for the assessment of the depth of content understanding and another criteria rating list for the variety and sophistication level of the Literacy Skills that had been taught. Ratings were given to all elementary, middle school, and high school transformations and then sorted by the criteria. The class then performed analysis and synthesis of all three. Happily, the assessments spanned the various levels of content understanding from novice to expert. They also spanned the embedded Information Skills from the creation of questions to high level sophistication of analysis and synthesis. Across grade levels, there was an interesting pattern of progress toward sophistication from elementary through middle school; but it seemed that high school assessments tended to start again with the basics and then move up to the higher sophistication levels. The use of the spreadsheet allowed for real time collection of the various assessments across learning experiences, judgment of each assessment by criteria, and finally the analysis and synthesis of the data all in real time. Such a real activity pushed the thinking of both the instructor and every person in the class. As a group, they could see that their transformations exhibited the characteristics of exemplary content learning enhanced by “just in time” information literacy. Units like these were designed to ensure that the students who would be taught in primary and secondary schools would gain the skills necessary for them to succeed in

college and their adult lives. A number of sample learning experiences can be found at: <https://sites.google.com/site/schoollearningcommons/>

**Example #2:**

An academic librarian, Marsha Hadley, accepted the job of instructional librarian in the university library and was pondering how to embed herself into the various departments. At a cafeteria lunch, she recognized the head of the English Department and asked if she could sit with him and another faculty member. Over their meals, she discovered that all the freshman English students were required to do a position paper on a topic of their choice. She expressed her concern that the previous effort to teach databases in a freshman orientation was very time consuming and ineffectual. She wondered aloud if she might combine her efforts with those who taught the position paper. The department head asked if she would like to prepare a plan and have the same lunch the next week. He admitted that because of the high number of non-native English speakers, the failure rate was much too high.

During the discussion the next week, it was decided to build this into an experimental study so that the results could be submitted for publication (translate tenure and promotion in a U.S. institution). The 40 sections of freshman English would be divided into two groups, experimental and control. Four instructors, each with four sections, volunteered to be in the experimental group. Marsha built a knowledge building center<sup>3</sup> for each of the instructors. Instead of allowing all the students to choose different topics, three major umbrella topics were chosen that students were likely to be passionate about. Each class, whether experimental or control would have groups in each class working on one of the three topics. Marsha did the following: she created three short videos on how to search the various databases and the Internet on the three topics. She also created a short video tutorial on how to judge the quality of articles discovered by the students. She placed these videos in the knowledge building centers for each instructor. She also set up online discussion forum open hours where she could virtually answer questions posted by the students in real time and these help sessions would be available 24/7 as “tip sheets.”

Each class in the experimental faculty’s section was divided into topical groups. In the knowledge building center each group developed questions and then developed a pool of ten position articles/blog posts or videos that used Marsha’s help videos and quality criteria. These articles were pulled into Google documents so that each member of the team could add comments, define words, point out factual problems, and any other suggestions for their fellow group members. Then using their “data bank,” each student wrote their own position paper and then added comments to at least two other student’s papers. The faculty member and Marsha commented on a random sample of the individual papers. Then, during class time, each group combined their individual papers into a group position paper using a Google document. The instructor could watch each of the three papers develop in real time and could offer advice and comments on the document in real time. Marsha provided another video on how to cite the various resources the students used in both their individual and collaborative papers. The instructors then graded the group papers for content and Marsha did a random evaluation of citations.

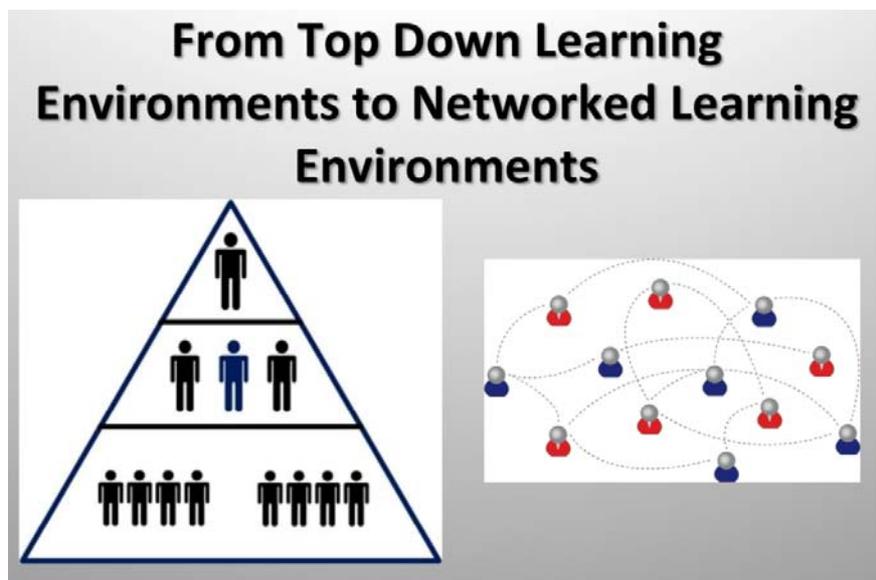
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<sup>3</sup> Knowledge Building Centers are websites built expressively to form a collaborative environment where a combination of faculty/classroom teachers/librarians and students construct, build, solve, and create using advanced instructional designs.

Finally, Marsha and the department head chose ten papers at random from the experimental group and ten from the control. The Department Head paid for an outside evaluator to rate the papers on both quality of argument, English usage, and citations. At the next department faculty meeting, the researcher presented the results of the experiment. Here, you, the reader, should supply the end of the story. What do you think might have happened? Do you think the process might be repeated the next semester? How do you think the non-English speakers might react?

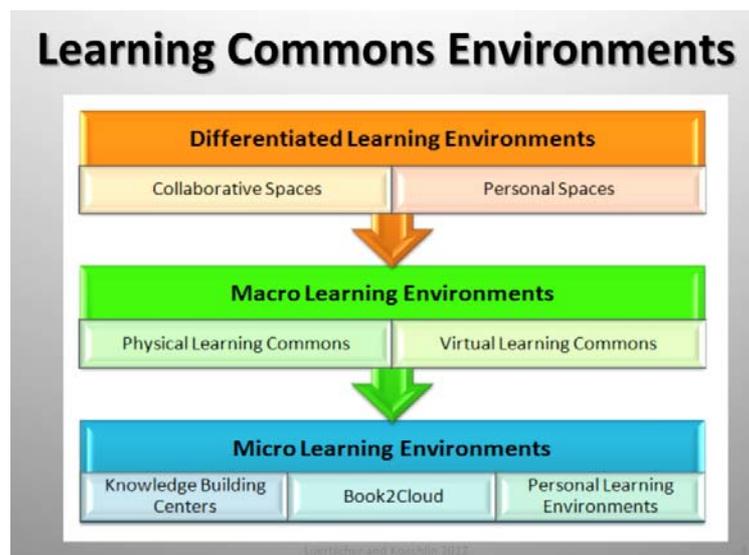
### **Reflections on the Impact of Technology on Content Learning and Learning How to Learn**

The current world of Web 2.0 free tools to educators opens up a huge opportunity to transform top-down learning experiences into networked or flat, or constructivist opportunities where embedded the expanded concept of information literacy enables high-level learning not possible in previous contexts. As pictured in Fig. 1.1 below, on the left is top down instructor as designer/leader. On the left constructivist opportunities are available.



A myriad of possibilities exist. Loertscher and Koechlin<sup>4</sup> have created three such environments for use in their vision of the physical or the virtual world in terms of a Learning Commons environment in basic education as shown in Figure 1.2:

<sup>4</sup> Loertscher, David V., Carol Koechlin, Sandi Zwaan, and Esther Rosenfeld. *The New Learning Commons Where Learners Win*. 2<sup>nd</sup> ed., Learning Commons Press, 2011. Available from <http://lmcsource.com>



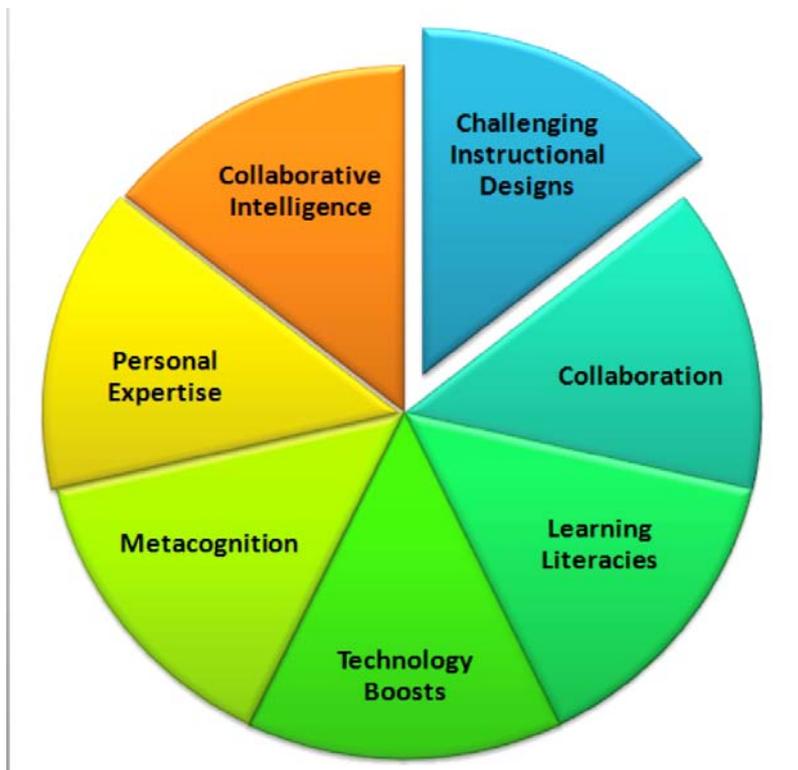
Pictured above as micro learning environments, you see the knowledge building center identified above as a website that is a collaborative environment.

In Book2Cloud<sup>5</sup> environments, complex texts, literature, art, or documents are placed in an open room where students guided by their faculty/teachers and librarians collaboratively curate from the Internet artifacts that demonstrate the meaning of the object under consideration. Using their information literacy skills, the students build, share, and develop deep understanding as a creative investigation. In the Personal Learning Environments,<sup>6</sup> learners create take command of their own learning by first constructing a portal to the Internet, then constructing their own personal learning network, and finally constructing both a personal and public portfolio as a major exhibition of what they know and what they have built collaboratively with others.

As Loertscher and Koechlin have been developing the above learning environments, they have had to reconsider the “learning how to” learning skills required to participate fully in such environments. Figure 1.3 illustrates those they have developed as critical:

<sup>5</sup> Book2Cloud is a constructivist learning experience that can be seen at: <http://sites.google.com/site/book2cloud/> where a number of examples are available.

<sup>6</sup> Learn more about Personal Learning Environments at: <https://sites.google.com/site/pleconstructionzone/>



These new learning environments are growing rapidly and are beginning to be shared and developed across the world. One excellent example is The Flat Classroom Project at: <http://www.flatclassroomproject.org/> and the recently published book about this project: *Flattening Classrooms, Engaging Minds: Move to Global Collaboration One Step at a Time* (Pearson Resources for 21st Century Learning) by Julie Lindsay and Vicki A. Davis. Allyn & Bacon, 2012.

At the center of these learning experiences lie innovative collaborative technologies that boost learning in ways not known before in the traditional classroom. A few examples might clarify what we are talking about. A Google document is a blank sheet of virtual “paper” that multiple students can write on simultaneously. A Google spreadsheet can be used as a real time data or idea gathering tool so that data or idea analysis can be done in real time with everyone watching and working, thinking and building simultaneously. A Google presentation can be constructed jointly by up to seven persons in real time. “Mindmeister” is a collaborative mind map construction tools; “Wallwisher” is a collaborative brainstorming tool, and “Gloster” is an example of tool for the collaborative tool for posters and infographics.

Every year, a wide variety of new tools become available globally, and they are either free or very inexpensive. Many organizations, professional and commercial create annual lists of these types of tools. This wealth of new environments challenges the creativity of all. Teaching and learning environments are in constant beta, and with each

new exponential opportunity comes the broadening of what librarians have known as information literacy. Not only do young people from beginning in school through university and then as adults need to develop research skills popularized in present models, they need to develop media literacy, critical thinking, habits of mind, creativity, ICT literacy, communication and collaboration skills in order to compete in knowledge economies across the world.

In their book, *Abundance: The Future is Better Than You Think*, Peter H. Diamandis and Steven Kotler discuss the potential of networked learning that can solve the great problems of the world if enough people will share their expertise through the global networks that are now growing exponentially. To understand the possibilities, check out the several lectures on YouTube by Diamandis.

Because of the rapid expansion of information and new technologies, traditional classroom environments are under attack. Cookie cutter approaches that lockstep the learning of prescribed content are giving way to new techniques such as the flip classroom. To be relevant, all librarians need to abandon traditional ways of teaching outmoded information literacy skills that are often irrelevant, boring, and useless in all these new virtual learning environments.

No time has been more challenging librarians in all types of libraries. As R. David Lankes in his *Atlas of New Librarianship*, MIT Press, 2011 notes, "The role of the new librarian is the creation of knowledge." Note that he did not say that storage and retrieval of information is the central role. Library and information science educators today face the challenge of preparing their undergraduate/master's and even PhD students for a future their professors were never educated for. The entire profession must move rapidly or collapse in the same way that horse-drawn carriages were replaced by motorized vehicles. If we do not respond, others will arise like the phoenix in a new role for a new age. Each person in the profession must decide immediately how to remain relevant. As Vi Harada has said: "It is a journey worth leading."

## References

Diamandis, Peter H. and Steven Kotler. *Abundance: The Future is Better than You Think*. Free Press, 2012.

Lankes, R. David. *Atlas of New Librarianship*, MIT Press, 2011.

Lindsay, Julie and Vicki A. Davis. *Flattening Classrooms, Engaging Minds: Move to Global Collaboration One Step at a Time*. Allyn & Bacon, 2012.

Loertscher, David V. and Blanche Woolls. *Information Literacy: a review of the Research*. Hi Willow Research Publishing, 2002. Available from <http://lmcsource.com>

Loertscher, David V., Carol Koechlin, Sandi Zwaan, and Esther Rosenfeld. *The New Learning Commons Where Learners Win*. 2<sup>nd</sup> ed., Learning Commons Press, 2011. Available from <http://lmcsource.com>

Zurkowski, Paul G. *The Information Service Environment Relationships and Priorities*. National Commission on Libraries and Information Science, 1974, p. 6.