

FEATURE ARTICLE



In recent years, teacher-librarians and college librarians have made strides in closing the gap between the senior year of high school and the first year of college.

Closing the 12-13 Gap Together: School and College Librarians Supporting 21st Century Learners

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Both teacher-librarians and college librarians require evidence to tailor instruction to 21st century skills and dispositions. One recent syllabus study reveals what students need to know and do to be successful during their first semester in college.

By forming partnerships, teacher-librarians and college librarians can duplicate this study and focus on the needs of students in their own high schools and colleges. When teacher-librarians and college librarians collaborate to gather evidence, they build sustaining partnerships, share their workload, and reveal important information that can be used to improve instruction and increase student success during the 12-13 transition.

CLOSING THE GAP

In recent years, teacher-librarians and college librarians have made strides in closing the gap between the senior year of high school and the first year of college. They have surveyed college faculty about what they expect from students and gathered anecdotal descriptions of student skill deficiencies noted by both teacher-librarians and college librarians. These opinion surveys and anecdotes provide only a partial picture of what students need to know to be successful in college. However, evidence-based studies provide concrete data that can be used to advocate for increased information literacy instruction on both sides of the 12-13 gap.

College librarians at one university studied the syllabi of first year students in the first semester, in an effort to determine which 21st century skills and dispositions are needed to perform inquiry-based research. At the college level, the results of this study can be used to argue for librarians to have more access to students for information literacy instruction, to fine tune the topics covered in those information literacy instruction sessions, boost librarian instructional skills, and to improve student learning (Oakleaf, 2009).

This study also has implications in the high school context. First, high school teacher-librarians can use the results to provide concrete evidence of the 21st century skills and dispositions their college-bound seniors will be required to exhibit in their first semester of college—information of interest to students, parents, teachers, and school administrators. Second, some teacher-librarians may wish to tailor the results by completing a similar study in partnership with college librarians at the college and universities their students attend. Either way, the evidence can be used to improve 21st century skills instruction at the high school level.

THE SYLLABUS STUDY

Two college librarians at North Carolina State University (NCSU), a university that admits over 4,000 first year students each year (VanScoy & Oakleaf, 2008), conducted a syllabus study by requesting course enrollment information about a random sample of 350 first year students' course schedules from the university registrar. Names and other personal information were stripped from the data to ensure student privacy. Next, the college librarians created a list of courses in which at least one student in the sample was enrolled. Then, the librarians checked course web sites and emailed instructors to collect syllabi and assignment sheets for the courses; ultimately, the librarians were able to locate information on all the courses for 139 of the students.

In the next step of the study, the librarians examined course syllabi for the presence of inquiry-based research assignments in order to determine the required research tasks. Research tasks were categorized as follows:

- Use articles
- Use books
- Use web sites
- Use reference books
- Use data and statistics

All students included in the study applied critical thinking skills to interact with at least one information source to create a new inquiry-based research product. Ninety-five percent interacted with web sites, 94% interacted with articles, and 85% in-

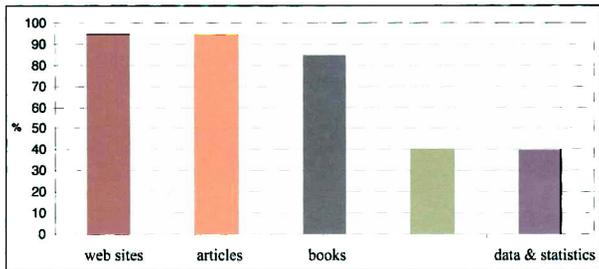


Figure 1. Percentages of Students Required to Use Source Types

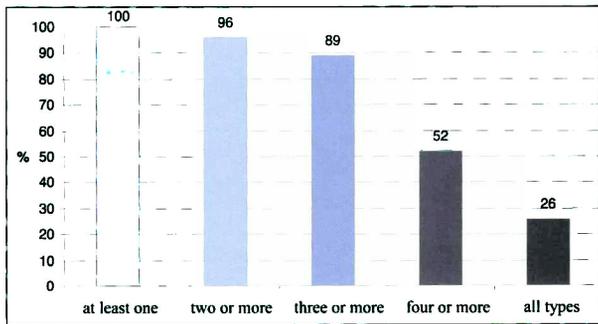


Figure 2. Percentages of Students Required to Use Multiple Source Types

teracted with books (see Figure 1). Forty percent interacted with reference books, and 40% interacted with data and statistics.

A majority of students interacted with multiple source types (see Figure 2), and 26% of the students studied interacted with them all!

The evidence produced by this study reveals a gap. First semester, first year college students must interact with information using 21st century skills and dispositions they may not have been taught in high school. Considering the inadequate student-to-librarian ratio at most colleges, these students may not have been taught them in college yet either.

Consequently, first-year students must demonstrate flexibility by adapting their traditional information-seeking strategies. For example, when students use web sites,

they must choose a search engine, construct an effective search, critically evaluate website quality, incorporate web site information, and cite the website ethically and responsibly (see Figures 3-6 for alignment to AASL, ISTE, ACRL, and Partnership for 21st Century Skills standards).

Using articles also requires first year students to employ a number of high-level inquiry-based research skills. They must navigate a library web site, choose an appropriate database, construct an effective search, distinguish popular and scholarly articles, evaluate article quality, and incorporate and cite article information ethically. Furthermore, critical-thinking students must display emotional resilience by persisting despite challenges. For instance, to use circulating books, students must navigate a library website and online catalog, construct a search, use LC classification, evaluate book quality, and incorporate and cite book information ethically.

To use reference books, students must complete the aforementioned tasks, as well as employ challenging search strategies that identify reference books within the rest of the collection, distinguish among a variety of reference books, and use evaluation criteria specific to reference books. Additionally, students must construct understandings, draw conclusions, and create new knowledge.

In situations calling for data and statistics, students must formulate a strategy to guide their search for organizations that

SOURCES STUDENTS USE IN COLLEGE					AASL STANDARDS FOR THE 21 st CENTURY LEARNER
WEB SITES	ARTICLES	BOOKS	REFERENCE BOOKS	DATA & STATISTICS	
Skills Required to Use Web Sites ↓	Skills Required to Use Articles ↓	Skills Required to Use Books ↓	Skills Required to Use Reference Books ↓	Skills Required to Use Data & Statistics ↓	
Choose a search engine	Navigate a library web site; choose an article database	Navigate a library web site and online catalog	Navigate a library web site, online catalog	Identify and locate sources of data and statistics	1.1.4 Find, evaluate, and select appropriate sources to answer questions.
Construct an effective web search	Construct an effective database search	Construct an effective online catalog search; use LC classification	Construct search strategies that identify reference books within the rest of the collection	Construct an effective search of data and statistics sources	1.1.8 Demonstrate mastery of technology tools for accessing information and pursuing inquiry. 1.2.5 Demonstrate adaptability by changing the inquiry focus, questions, resources, or strategies when necessary to achieve success. 1.2.6 Display emotional resilience by persisting in information searching despite challenges. 1.2.7 Display persistence by continuing to pursue information to gain a broad perspective. 2.2.1 Demonstrate flexibility in the use of resources by adapting information strategies to each specific resource and by seeking additional resources when clear conclusions cannot be drawn.
Evaluate web site quality	Distinguish popular and scholarly articles; evaluate article quality	Evaluate book quality	Distinguish among a variety of reference books; use evaluation criteria specific to reference books	Interpret and evaluate data and statistics	1.1.5 Evaluate information found in selected sources on the basis of accuracy, validity, appropriateness for needs, importance, and social and cultural context. 1.2.4 Maintain a critical stance by questioning the validity and accuracy of all information.

Figure 3. Sources Students Use in College & Corresponding AASL Standards

care enough to compile data. They must interpret and evaluate the data and statistics, integrate the information and cite it ethically. The evidence produced by this study suggests that, if students do not adapt and learn these 21st century skills and dispositions before leaving high school, it is likely they will not be adequately prepared to participate in college-level inquiry-based research.

FINDING OUT WHAT YOUR SENIORS NEED TO KNOW

Although is informative to know what 21st century skills and dispositions any first semester, first-year students need to conduct inquiry-based research, extending this study to uncover the skills seniors in your school need may be substantially more useful for improving information literacy instruction. Tailoring the study to the seniors at your high school may seem daunt-

ing however the teacher-librarian does not have to go it alone. By partnering with college librarians, it is possible to share the evidence-gathering workload needed to implement instructional improvements and move college-bound seniors over the 12-13 gap.

Form Partnerships

While the teacher-librarian probably acknowledges the general value of collaboration (see textbox), there may be uncertainty about how to partner in ways that are directly related to 21st century student learning and achievement. One strategy is a syllabus study. The first step in a syllabus study is to identify a college connection. To get the most relevant evidence, partner with a college librarian at the college most students from your school are likely to attend. If you do not know that information, ask the seniors. Or, for

a more complete picture, ask school guidance counselors.

In preparation for writing this article, the authors called the guidance counselors' office at several area high schools to ask "What colleges are graduating seniors most likely to attend?" In less than five minutes, each school provided a list.

Once there is a list of possible colleges, the next step is to identify a partner at one of them. There may be an established connection or a colleague may recommend a college reference and instruction librarian. If not, visit college library web sites or call college library reference desks to identify a contact person. Many college libraries have a first-year experience librarian or instruction coordinator; nearly all have a head of reference services. Any of these librarians can get you started. Once you identify a collaborator at the college level, share the following steps.

Rationale for the Collaboration of Teacher-Librarians and College Librarians

Teacher-librarians and college librarians should collaborate to help students bridge the gap between high school and college (Daniel, 1997; Matorana et al., 2001; Ford, 1996). They share a common vision of student success, information literacy program goals (Carr & Rockman, 2003), and challenges to achieving those common goals (Donham, 2003). According to the AASL and ACRL Task Force on the Educational Role of Libraries (1998), teacher-librarians and college librarians, "share the goals of fostering lifelong learning and ensuring that students at all educational levels are prepared to meet the challenges of the 21st century (para. 2)." They have similar user populations and the same need to work with subject area

faculty (Muronga & Harada, 2001, Jackson & Hansen, 2006). Also, teacher-librarians need to increase student achievement, and college librarians need to demonstrate their impact on student learning, increased student retention, and degree completion (Carr & Rockman, 2003). For all these student learning-focused reasons, teacher-librarians and college librarians should form partnerships to support the students they serve.

In addition to the advantages to students, collaborative partnerships also benefit librarians. When teacher-librarians and college librarians form meaningful, lasting connections, they learn from each other, extend their current knowledge, and develop new skills. The *NBPTS for Library Me-*

dia (2001) recognizes the benefits as well: "With a goal of strengthening library media programs and expanding information literacy, accomplished library media specialists welcome partnerships with cultural and educational institutions such as...university libraries" (p. 44). The AASL (2009) agrees: "The school library media specialist...collaborates with an extended team that includes...college...libraries...to include their expertise and assistance in inquiry lessons and units" (p. 20). Indeed, when teacher-librarians partner with college librarians, they develop learning communities that offer rich self-initiated professional development opportunities

SOURCES STUDENTS USE IN COLLEGE					ISTE NATIONAL EDUCATIONAL TECHNOLOGY STANDARDS (NETS-S) AND PERFORMANCE INDICATORS FOR STUDENTS
WEB SITES	ARTICLES	BOOKS	REFERENCE BOOKS	DATA & STATISTICS	
Skills Required to Use Web sites	Skills Required to Use Articles	Skills Required to Use Books	Skills Required to Use Reference Books	Skills Required to Use Data & Statistics	
↓	↓	↓	↓	↓	
Choose a search engine	Navigate a library web site; choose an article database	Navigate a library web site and online catalog	Navigate a library web site, online catalog	Identify and locate sources of data and statistics	
Construct an effective web search	Construct an effective database search	Construct an effective online catalog search; use LC classification	Construct search strategies that identify reference books within the rest of the collection	Construct an effective search of data and statistics sources	
Evaluate web site quality	Distinguish popular and scholarly articles; evaluate article quality	Evaluate book quality	Distinguish among a variety of reference books; use evaluation criteria specific to reference books	Interpret and evaluate data and statistics	
Incorporate web site information into an assignment	Incorporate article information into an assignment	Incorporate book information into an assignment	Incorporate reference book information into an assignment	Incorporate data and statistics information into an assignment	
					3b. Students locate...information from a variety of sources and media. 6b. Students select...applications effectively and productively.
					3a. Students plan strategies to guide inquiry. 6b. Students...use applications effectively and productively.
					3b. Students...evaluate...information from a variety of sources and media. 3c. Students evaluate and select information sources and digital tools based on the appropriateness to specific tasks.
					1a. Students apply existing knowledge to generate new ideas, products, or processes. 1b. Students create original works as a means of personal or group expression. 2b. Students communicate information and ideas effectively to multiple audiences using a variety of media and formats. 3b. Students...synthesize...information from a variety of sources and media. 4c. Students collect and analyze data to identify solutions and/or make informed decisions.

Figure 4. Sources Students Use in College & Corresponding ISTE Standards

SOURCES STUDENTS USE IN COLLEGE					PARTNERSHIP FOR 21 ST CENTURY SKILLS	
WEB SITES	ARTICLES	BOOKS	REFERENCE BOOKS	DATA & STATISTICS		
Skills Required to Use Web sites 	Skills Required to Use Articles 	Skills Required to Use Books 	Skills Required to Use Reference Books 	Skills Required to Use Data & Statistics 		
Choose a search engine	Navigate a library web site; choose an article database	Navigate a library web site and online catalog	Navigate a library web site, online catalog	Identify and locate sources of data and statistics		<ul style="list-style-type: none"> Accessing information efficiently and effectively. (Information, Media & Technology Skills-IM&T Skills)
Construct an effective web search	Construct an effective database search	Construct an effective online catalog search; use LC classification	Construct search strategies that identify reference books within the rest of the collection	Construct an effective search of data and statistics sources		<ul style="list-style-type: none"> Using technology as a tool to research. (IM&T Skills) Using digital technology, communication tools and/or networks appropriately to access...information in order to function in a knowledge economy. (IM&T Skills)
Evaluate web site quality	Distinguish popular and scholarly articles; evaluate article quality	Evaluate book quality	Distinguish among a variety of reference books; use evaluation criteria specific to reference books	Interpret and evaluate data and statistics	<ul style="list-style-type: none"> Evaluating information critically and competently. (IM&T Skills) Using technology as a tool to...evaluate information. (IM&T Skills) Using digital technology, communication tools and/or networks appropriately to...evaluate...information in order to function in a knowledge economy. (IM&T Skills) 	
Incorporate web site information into an assignment	Incorporate article information into an assignment	Incorporate book information into an assignment	Incorporate reference book information into an assignment	Incorporate data and statistics information into an assignment	<ul style="list-style-type: none"> Articulating thoughts and ideas clearly and effectively through speaking and writing. (Learning & Innovation Skills-L&I Skills) Framing, analyzing, and synthesizing information to solve problems and answer questions. (L&I Skills) Using information accurately and creatively for the issue or problem at hand. (IM&T Skills) Using technology as a tool to...organize...and communicate information. (IM&T Skills) Using digital technology, communication tools and/or networks appropriately to...manage, integrate...and create information in order to function in a knowledge economy. (IM&T Skills) 	

Figure 5. Sources Students Use in College & Corresponding 21st Century Skills

Get the Syllabi

The second step in a syllabus study is collecting course syllabi. (It is better for the college library partner to complete this task.) To begin, the college librarian investigates the human subjects or institutional review procedure at their college. If the plan is to publish the results, then the college librarian completes an institutional review board (IRB) application, which consists of a form and approval process. After receiving IRB approval, the college librarian contacts the university registrar and requests a random sample of first year students with personal information (name, student identification number, etc.) removed. Next, adjust the sample size depending on available time and overall number of first year students. In the NCSU study, the random sample was

equal to 10% of the first year class.

Next, the college librarian begins the process of collecting course syllabi by accessing the learning management systems (WebCT, Blackboard, Moodle) or by contacting department offices. In preparation for this article, the authors called college departments at four institutions. At three of the four, the department administrative assistant provided syllabi in three-ring binders. The remaining institution supplied the syllabi electronically.

Get a Plan

With syllabi in hand, the teacher-librarian and the college librarian devise a plan for analysis. At NCSU, librarians created a short checklist of 21st century inquiry-based tasks aligned with the AASL Stan-

ards for the 21st Century Learner (2007) and the ACRL *Information Literacy Competency Standards for Higher Education* (2000). The *Framework for 21st Century Learning* (2009), the *ISTE National Educational Technology Standards (NETS-5)* and *Performance Indicators for Students* (2007), state-determined college content standards, or another local framework would also be a good foundation. Once the teacher-librarian and the college librarian agree on a plan for analyzing the syllabi, divide them for efficiency. It is important at this point to double-check at least a portion of each other's work.

Sum It Up & Apply the Evidence

After all the syllabi are examined and analyzed, summarize the evidence together.

What are the results? What does a 21st century college learner look like? What skills and dispositions do ready-to-graduate high school seniors need to exhibit as first semester, first year college students?

After completing the summary, determine what changes and enhancements to teaching and learning are suggested by the evidence. What implications do the findings have for teaching high school seniors and students in grades 9-11? What are the implications for instruction offered to first semester, first year students in college? How does a high school or higher education context affect the implementation of 21st century instruction? What are the interconnections between the two contexts?

Share the Evidence

Simple percentages tell a convincing story and are intuitively understood by stakeholders including students, parents, teachers, and administrators. After considering stakeholder needs, determine the best way to format the findings. Will a bar chart tell the story? Will a comparison to local curriculum content be more effective or showing an alignment between the evidence provided by the study and the library lessons your high school or college offers? What vehicle will best describe the evidence, demonstrate the need for improvement, and advocate for the school library? Maybe a brief PowerPoint slide show for administrators, a one-page summary, a brochure for parents, or a newsletter sto-

ry for teachers may be more appropriate? Bear in mind that more than one approach may work, depending on the audience.

CONCLUSION

Evidence-based research is one method for revealing the 21st century skills and dispositions your students need to be successful in their first semester of college. The step-by-step process described in this article can help both the teacher-librarian and the college library partner improve the critical areas of instruction 21st century learners deserve. By sharing new understandings gleaned from this article, teacher-librarians can initiate professional partnerships with college librarians, encourage each other to gather syllabi information, analyze the

SOURCES STUDENTS USE IN COLLEGE					ACRL INFORMATION LITERACY COMPETENCY STANDARDS FOR HIGHER EDUCATION	
WEB SITES	ARTICLES	BOOKS	REFERENCE BOOKS	DATA & STATISTICS		
Skills Required to Use Web sites 	Skills Required to Use Articles 	Skills Required to Use Books 	Skills Required to Use Reference Books 	Skills Required to Use Data & Statistics 		
Choose a search engine	Navigate a library web site; choose an article database	Navigate a library website and online catalog	Navigate a library website, online catalog	Identify and locate sources of data and statistics		2. The information literate student accesses needed information effectively and efficiently. 2.1 The information literate student selects the most appropriate investigative methods or information retrieval systems for accessing the needed information.
Construct an effective web search	Construct an effective database search	Construct an effective online catalog search; use LC classification	Construct search strategies that identify reference books within the rest of the collection	Construct an effective search of data and statistics sources		2. The information literate student accesses needed information effectively and efficiently. 2.2 The information literate student constructs and implements effectively-designed search strategies. 2.4 The information literate student refines the search strategy as needed.
Evaluate web site quality	Distinguish popular and scholarly articles; evaluate article quality	Evaluate book quality	Distinguish among a variety of reference books; use evaluation criteria specific to reference books	Interpret and evaluate data and statistics	3. The information literate student evaluates information and its sources critically and incorporates selected information into his or her knowledge base and value system. 3.2 The information literate student articulates and applies initial criteria for evaluating both the information and its sources.	
Incorporate web site information into an assignment	Incorporate article information into an assignment	Incorporate book information into an assignment	Incorporate reference book information into an assignment	Incorporate data and statistics information into an assignment	2.5 The information literate student extracts, records, and manages the information and its sources. 3.1 The information literate student summarizes the main ideas to be extracted from the information gathered. 3.3 The information literate student synthesizes main ideas to construct new concepts. 4. The information literate student, individually or as a member of a group, uses information effectively to accomplish a specific purpose. 4.1 The information literate student applies new and prior information to the planning and creation of a particular product or performance. 4.3 The information literate student communicates the product or performance effectively to others.	

Figure 6. Sources Students Use in College & Corresponding ACRL Standards

tasks required of students, and use the resulting data to improve instructional efforts—in short, use this article to close the 12-13 gap.

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