

samples had an overall grade point average (GPA) that was between 2.7 and 3.3 (B to B+). Despite their relatively high grade point averages, the research process for a variety of reasons frequently frustrated students. According to the survey data, the typical student struggles with research assignments because of: (1) his or her own tendency to procrastinate (73%), (2) his or her feelings of being overwhelmed by all the information that is “out there” (60%), and (3) his or her inability to narrow down a topic and make it manageable (59%).²⁹ In combination, these data support an overall finding: Most students are challenged by tasks requiring specific information literacy competencies, such as retrieving, evaluating, selecting, and using information.

For many students, the research process is a barely “tolerable task,” usually delayed until a few days before a drop-dead due date. All but one of the participants in the discussion group described themselves as procrastinators. As with any procrastinator, time is always of the essence; and, for students who procrastinate on research assignments, the situation is no different.

Students surveyed only spent one to five hours (77%) conducting research and collecting resources. After completing the research, most students spent one to five more hours (72%) writing and editing a four- to six-page research paper. When

working on assignments, students are primarily concerned with the grade they will receive (44%) and less concerned with getting the assignment finished (20%) and being creative (10%).

Challenges and Obstacles: Research Assignment Handouts

Students in the discussion groups reported that one of their most serious obstacles is understanding professors’ expectations for assignments. Trying to figure out exactly what each professor expected caused the most frustration for twelve out of thirteen discussion group participants. The survey substantiated these results: Nearly half of the survey sample strongly agreed with the statement that a lack of information from the assigning professor stymied them the most, sometimes keeping them from beginning an assignment at all (48%).

The content analysis of the handouts professors distributed for research assignments lends further insight into students’ inability to know what their professors expected. From a systematic content analysis, the data show a lack of detail and guidance in many research assignment handouts.³⁰ As a whole, the handouts offered little direction about: (1) plotting the course for research, (2) crafting a quality paper, and (3) preparing a paper that adheres to a grading rubric of some kind.

TABLE 3
Resources that Professors Do and Do Not Recommend

	Requires	Recommends	Discourages	Prohibits	No Mention
Reference librarian	— 0	17% 5	— 0	— 0	83% 25
Online resources from library site	17% 5	10% 3	— 0	— 0	73% 22
In-library resources (off the shelves and on-site)	13% 4	13% 4	3% 1	— 0	70% 21
Resources found on the Web	3% 1	3% 1	3% 1	3% 1	87% 26

Source: Content Analysis, n=30

Few of the handouts analyzed mentioned where students were to look for research resources. In particular, most handouts had no information about whether or not to use resources such as the Web (87%), a librarian (83%), online resources from the school's library site (73%), or library resources pulled right off the shelf (70%). Table 3 shows a breakdown of research guidance professors offered in research handouts that were analyzed.

When provided, the guidelines for crafting a quality research paper were often terse and formulaic. Only about a third of the handouts (30%) made some reference to plagiarism and the ethical use of information. Among those that did, most handouts only referenced the college's Honor Code and advised students to consult the code on their own for more information. Last, grading criteria—many students' major concern when working on a research assignment—were sorely underrepresented. Only four out of thirty (16%) of the handouts included either a grading rubric or a point breakdown for an assignment. Table 4 shows a breakdown of guidelines professors included in research handouts for crafting quality papers.

Discussion

There is an ongoing discussion in the library literature, claiming students have a paucity of information literacy compe-

tencies and are less likely than ever to take advantage of the campus library. At the same time, students' usage of public Internet sites for academic research is reportedly on the rise.

Data from this study substantiated some—but not all—of these claims. In contrast to some previous claims, this study found that students actually do use the campus library. Students also found a number of library resources to be helpful, including reference librarians and the databases from the library Web site. In the survey, a majority of students reported not being as reliant on search engines, as other research studies have suggested for beginning their academic research; only one in thirteen of the students in the survey reported having used Yahoo! or Google in the initial stage of their academic research.

However, this study did find students lacking in information literacy competencies, especially as detailed in the ACRL standards for higher education. In particular, students in this study reported that they struggled to: (1) determine the nature and extent of information needed,³¹ and (2) evaluate information and its sources critically to incorporate selected information into their knowledge base and value system.³²

The following snapshot of the student research experience emerged from this study's findings, based on students' own

TABLE 4
How Should a Quality Paper Be Crafted?

	Yes	No
Includes information on plagiarism and ethical use of information (i.e., defines plagiarism, cites SMC Honor Code).	30% 9	70% 21
Includes information on proper citation style.	43% 13	57% 17
Includes information on reviewing authority of materials.	20% 6	80% 24
Includes information on reviewing currency of materials.	17% 5	83% 25
Includes information about using spell-check.	7% 2	93% 28

Source: Content Analysis, n=30

accounts, experiences, and opinions about conducting academic research:

1. Most students are baffled by college-level research, especially when they must begin the process and define their information needs. As a result, students face a variety of obstacles, including their own procrastination.

2. Other challenges relate to accessing and critically evaluating quality resources, especially what students describe as their own inability to narrow down topics and make them manageable. Students also have a tendency to become overwhelmed by the plethora of available resources, including many from the Web, that are available to them.

3. The most significant obstacle for students, however, is figuring out what each research assignment entails, especially when they are writing different papers for more than one professor.

A Hybrid Approach to Research

Despite their information literacy challenges, students in the discussion groups reported using a “tried and true” research strategy for completing humanities and social science research assignments. Students’ workaround relied heavily on accessing research materials from the library Web site or course readings. One explanation for this approach is that students considered such sources to have already been vetted and more likely to meet professors’ expectations for quality research—standards poorly described in professors’ research handouts analyzed in this study. Another explanation for this approach is that students do not know how to find—let alone evaluate—quality research sources on the Internet. Consequently, students were more likely to trust more reliable aggregators for what constituted “scholarly sources” (that is, professors, librarians, and the sources in vendor databases).

From the survey, students also clearly valued individualized training. Training from librarians and professors about how to conduct research and overcome certain

problems was helpful. Students were baffled by how to begin assignments, meet the expectations of different professors, and to limit a topic to a manageable scope; Internet searches can do little to mitigate these problems. To a lesser extent, students reported problems with determining the credibility of resources and avoiding plagiarism. One explanation for needing individualized training is that students are trying to close the gap they know exists between their own knowledge of the research process and that of their instructors.

This study found that most students find it difficult to conceptualize and to operationalize course-related research. For many students, course-related research is nearly impossible, despite the convenience and students’ assumed reliance on the Internet. Students appear to be particularly limited in their ability to find “good, citable stuff,” especially when mining public Internet sites.

These findings suggest that, even though young people may have been exposed to computers since they learned the alphabet and may be avid users of sites like MySpace and YouTube, college-aged students are no more likely to be natural-born researchers and scholars than anyone else. Conducting secondary research remains a formidable task, one that must be learned through instruction and honed with practice—a fact that librarians have known for ages.

Conclusion

This study is a departure from most of the research literature about the topic of information literacy. By collecting data from students’ own accounts, this study found that students are aware of and frustrated by their own problems with selecting and evaluating information. Consequently, a majority of students reported using a hybrid approach to research as a workaround for achieving success in their course assignments.

There are limitations to the study, given the exploratory nature of the work, the size

of the study population and samples, and the inherent issue of “self report,” which is always problematic when a survey method or discussion groups are employed. Further research with a more diverse sample at different institutions (such as public and private universities and community colleges) is essential to generalize these initial findings. Yet findings from this study may be a good basis for accompanying information literacy initiatives already in place on campuses (as long as further research is conducted about individual settings).

To that end, three recommendations are offered to professors and librarians who hope to improve students’ information literacy levels:

1. Professors should be more explicit about their expectations when they prepare handouts for research assignments. Handouts need to inform students about the following: (1) how to carry out sec-

ondary research, (2) how to craft quality papers, and (3) how students’ work will be evaluated. In some institutions, individual departments have begun adopting a single grading rubric that appears on each course syllabus.³³ A similar approach could be used by instituting or at least recommending a “research rubric” for faculty handouts.

2. Both professors and librarians may want to expand, if at all feasible, the hands-on services and support that are already provided to students. Data from this study showed that students valued one-on-one coaching sessions with these research “experts.”

3. Finally, the value of human over computer-mediated services should not be underestimated, especially when it comes to developing practices and initiatives for improving the information literacy competencies of students taking humanities and social science courses.

Appendix A: Student Survey Form

1. Please start off by telling us a little about you. Are you:

- Female
- Male

2. How old were you on your last birthday?

- 19–20 years old
- 21–22 years old
- 23–25 years old
- Over 25 years old

3. Are you currently a junior or a senior, according to the Registrar’s Office on campus?

- Junior
- Senior

4. What was your overall GPA, as of last semester, according to the Registrar’s Office on campus?

- 4.0–3.8 (A)
- 3.7–3.4 (A-)
- 3.3–3.1 (B+)
- 3.0–2.7 (B)
- 2.6–2.4 (B-)
- 2.3–2.0 (C+)
- No answer from respondent

5. What is your major?

- Anthropology and Sociology
- Art and Art History
- Classical Languages
- Communication
- Cross-Cultural Studies
- Economics
- English and Drama
- History
- Kinesiology
- Liberal and Civic Studies
- Modern Languages
- Performing Arts: Dance, Music, and Theater
- Philosophy
- Politics
- Psychology
- Religious Studies
- Women's Studies
- If other, including double majors, please specify:

6. As a Humanities or Social Sciences major, what one type of research paper do you write in your classes most frequently? (Please choose one answer only.)

- Argument papers about a social issue (e.g., 4–6 pages)
- Literature reviews
- Case study analyses
- Theory papers (applying a theory covered in class to a topic)
- Semester-long projects (e.g., thesis)
- No answer from respondent
- If other, please specify:

7. What is the first step you take in your own research process for a 4–6-page paper in Humanities or Social Sciences course?

- Use a textbook or other reading(s) from the class
- Talk to the professor outside of class, who assigned the research paper
- Use a search engine to find resources (e.g., Google, Yahoo!)
- Use an online “community encyclopedia,” where anyone can contribute content and post it on the Web (i.e., Wikipedia)
- Use an online or print scholarly encyclopedia (e.g., Britannica)
- Use the online resources available through the SMC Library Web site
- Consult a reference librarian in the SMC Library
- Visit the SMC Library and see what I can find on the shelf
- Buy a book(s) that has information I can use
- No answer from respondent

8. What is the second step you take in your own research process?

- Use a textbook or other reading(s) from the class
- Talk to the professor outside of class, who assigned the research paper
- Use a search engine to find resources (e.g., Google, Yahoo!)
- Use an online “community encyclopedia,” where anyone can contribute content and post it on the Web (e.g., Wikipedia)

- Use an online or print scholarly encyclopedia (e.g., Britannica)
- Use the online resources available through the SMC Library Web site
- Consult a reference librarian in the SMC Library
- Visit the SMC Library and see what I can find on the shelf
- Buy a book(s) that has information I can use
- If other, please specify:
- No answer from respondent

9. What is the third step you take in your own research process?

- Use a textbook or other reading(s) from the class
- Talk to the professor outside of class, who assigned the research paper
- Use a search engine to find resources (e.g., Google, Yahoo!)
- Use an online "community encyclopedia," where anyone can contribute content and post it on the Web (e.g., Wikipedia)
- Use an online or print scholarly encyclopedia (e.g., Britannica)
- Use the online resources available through the SMC Library Web site
- Consult a reference librarian in the SMC Library
- Visit the SMC Library and see what I can find on the shelf
- Buy a book(s) that has information I can use
- If other, please specify
- No answer from respondent

10. What SMC Library resources do you find you helpful when you are conducting research for a 4–6-page research assignment? How much do you agree with each one of the following statements?

	Strongly Disagree	Somewhat Disagree	Neither Agree nor Disagree	Somewhat Agree	Strongly Agree	No Answer from Respondent
SMC reference librarians are helpful to me during the research process						
Online databases available through the SMC library Web site are helpful to me during the research process						
Resources that I find on the shelf in the library are helpful to me during the research process						
In-class sessions on how to conduct research that are taught by librarians are helpful to me during the research process						

11. How do professors help you do better at completing their research assignments? How much do you agree with each one of the following statements?						
	Strongly Disagree	Somewhat Disagree	Neither Agree nor Disagree	Somewhat Agree	Strongly Agree	No Answer from Respondent
Professors help me do better on their research assignments when they have separate deadlines for different parts of the entire assignment (e.g., introduction due first, then body due later, and so on)						
Professors help me do better on their research assignments when they let me turn in drafts that they comment on so that I can revise my work						
Professors help me do better on their research assignments when they have one-on-one sessions where they “coach” me through the research process and make suggestions about how to proceed						
12. Now let’s turn to the problems you may have experienced when you are conducting research for Humanities and Social Sciences assignments. How much do you agree or disagree with each of the following statements? I have problems conducting research...						
I have problems with the research process when I don’t have enough information from the professor to begin the assignment						
I have problems with the research process when I have to start on the assignment and overcome my own tendencies to procrastinate						

	Strongly Disagree	Somewhat Disagree	Neither Agree nor Disagree	Somewhat Agree	Strongly Agree	No Answer from Respondent
I have problems with the research process when I have to narrow down a topic and make it manageable						
I have problems with the research process when I need to evaluate what constitutes a credible resource for a given assignment						
I have problems with the research process when I become overwhelmed by all the information that is out there						
I have problems with the research process when I have to figure out how to avoid plagiarizing in my paper						
I have problems with the research process when I have to figure out what each professor wants in his or her particular assignment						
I have problems with the research process when I try to find resources using the SMC library Web site						
I have problems with the research process when I have to conform to the professor's perspective, instead of my expressing my own perspective						

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	Strongly Disagree	Somewhat Disagree	Neither Agree nor Disagree	Somewhat Agree	Strongly Agree	No Answer from Respondent
I have problems with the research process when I have to write the actual paper						
I have problems with the research process when I have to overcome my own anxiety with the research process						

13. On the average, how much time do you allocate for researching and collecting resources for a 4–6-page research paper for a Humanities or Social Sciences class? (Please choose one answer only.)

- Under 1 hour
- 1–2 hours
- 3–5 hours
- 6–9 hours
- More than 9 hours

14. On the average, how much time do you allocate for writing and editing a 4–6-page research paper for a Humanities or Social Sciences class? (Please choose one answer only.)

- Under 1 hour
- 1–2 hours
- 3–5 hours
- 6–9 hours
- More than 9 hours

15. What one-thing matters to you the most when you are working on a 4–6-page research paper for a Humanities or Social Sciences class? (Please choose one answer only.)

- The grade I get from the professor.
- Getting the assignment finished
- Learning something new
- Being creative with an assignment
- Finding the best research resources I can
- Improving my research skills
- No answer from respondent
- If other, please specify:

Notes

1. This definition of information literacy is a compilation, derived from definitions provided by different campus libraries and published online. Available online from www.google.com/search?hl=en&client=firefox-a&rls=org.mozilla:enUS:official&hs=1P3&pwst=1&defl=en&q=define:Information+Literacy&sa=X&oi=glossary_definition&ct=title. [Accessed 24 April 2007].
2. For more about the complexities with defining information literacy, see David Bawden, "Information and Digital Literacies: A Review of Concepts," *Journal of Documentation* 57 (Mar. 2001): 218–59.
3. For one of the few studies published in the library literature about students' research practices, see the qualitative study by Gloria J. Leckie, "Desperately Seeking Citations: Uncovering Faculty Assumptions about the Undergraduate Research Process," *Journal of Academic Librarianship*, 22 (May 1996): 201–08.
4. Another article by the same author, discussing findings from this research, appeared in *First Monday* and was entitled "Beyond Google: How Do Students Conduct Academic Research?" by Alison J. Head, *First Monday* 12, no. 8 (Aug. 2007) and is available online from http://firstmonday.org/issues/issue12_8/head/index.html. [Accessed 25 October 2007] and a First Monday Podcast entitled, "Google Scholars?," an interview with Alison Head (Feb. 2008), http://www.firstmondaypodcast.org/audio/head_final.mp3, (5.3 MB, 15:22). [Accessed 21 July 2008].
5. The complete report issued from this study, including research tools, is available online from <http://library.stmarys-ca.edu/features/SMCInfoLit.pdf> (400 KB). [Accessed 6 July 2007].
6. *Ibid.*
7. A definition of information literacy was first issued by ACRL in 1989. In 2000, ACRL published "Information Literacy Competency Standards for Higher Education," ACRL Standards Committee (2000), in which they laid out standards, performance indicators, and outcome measures and referred to their own 1989 definition, while expanding its meaning at the same time. Available online from <http://www.ala.org/ala/acrl/acrlstandards/standards.pdf>. [Accessed 26 June 2007].
8. *Ibid.*
9. *Ibid.*, 2.
10. *Ibid.*, 3.
11. *Ibid.*, 4.
12. The statistic, 13 percent, which described information literacy rates from the ETS study, appeared in an article about the ETS study by Andrea L. Foster, "Students Lack 'Information Literacy' Testing Service Finds," *Chronicle of Higher Education*, Oct. 17, 2006. For preliminary results from the study, see Educational Testing Services, *2006 ICT Literacy Assessment Preliminary Findings* (2007). Available online from www.ets.org/Media/Products/ICT_Literacy/pdf/2006_Preliminary_Findings.pdf. [Accessed 26 June 2007].
13. In Kathleen Dunn's large-scale quantitative 2002 study of students enrolled in the California State University System, she found information literacy levels are strongly correlated with library use. The finding was published in "Assessing Information Literacy Skills in the California State University: A Progress Report," *Journal of Academic Librarianship*, 28, no. 1–2 (Jan.–Mar. 2002): 26–35.
14. Steve Jones, "The Internet Goes to College: How Students Are Living in the Future with Today's Technology," *Pew Internet and American Life Project*, (Sep. 2002). Available online from www.pewinternet.org/pdfs/PIP_College_Report.pdf. [Accessed 27 June 2007].
15. See Anna M. Van Scoyoc, "The Electronic Academic Library: Undergraduate Research Behavior in a Library without Books," *Libraries and the Academy* 6 (Jan. 2006): 47–58; and Deborah J. Grimes and Carl H. Boening, "Worries with the Web: A Look at Student Use of Web Resources," *College & Research Libraries* 62, no. 4 (2005): 11–23. Grimes' article available online from www.ala.org/ala/acrl/acrlpubs/crljournal/backissues2001b/january01/grimes.pdf. [Accessed 28 June 2007].
16. Christen Thompson, "Information Illiterate or Lazy: How College Students Use the Web for Research," *Libraries and the Academy* 3, no. 2 (Apr.) 259–68.
17. Angela Weiler, "Information-Seeking Behavior in Generation Y Students: Motivation, Critical Thinking, and Learning Theory," *Journal of Academic Librarianship* 31, no. 1 (Jan. 2005): 46–53.
18. Anne F. Pierce, "Improving the Strategies High School Students Use to Conduct Research on the Internet by Teaching Essential Skills and Providing Practical Skills," ED 427756 (1998).
19. *Ibid.*
20. Leckie, "Desperately Seeking Citations," 203.
21. *Ibid.*
22. *Ibid.*
23. Christopher Hollister, "Having Something to Say," *Communications in Information Literacy* 1, no. 1 (2007). Available online from www.comminfolit.org/index.php/cil/article/view/Spring2007ED1/24. [Accessed 27 June 2007].

24. *Saint Mary's College Fact Book* (2007). Available online from www.stmarys-ca.edu/about/fact_book/toc.html. [Accessed 24 June 2007].

25. The sample is fairly representative of gender of the overall student population on campus. Current statistics from the SMC Fact Book show the SMC population is 65 percent female and 35 percent male.

26. Kimberly A. Neuendorf, *The Content Analysis Guidebook* (Thousand Oaks, Calif.: Sage, 2002), 151. Also see Klaus Krippendorff, *Content Analysis: An Introduction to its Methodology* (Thousand Oaks, Calif.: Sage, 1980): 134.

27. Neuendorf, *The Content Analysis Guidebook*, 143.

28. Note that students in the survey (40%) reported turning to course readings first for academic research. Although professors and librarians may define course-related research as identifying, evaluating, and using "outside references," our student sample considered class readings a logical first step in their research process, especially as they tried to narrow down a topic and determine the scope of their papers.

29. The data reporting students' limitations was derived from Survey Question #12, which used a five-point Likert scale (that is, a statement that asks the respondents to rank their level of agreement to disagreement with the statement). The percentages reported in this section combine the percentages and collapse two response categories: those who "strongly agreed" and "somewhat agreed" with statements about what worked for them when they conducted research and what challenges they faced.

30. Note that our content analysis was of research handouts professors have distributed in SMC classes over the last two years. We did not collect or analyze data about the information and explanations professors may verbally provide to students in class or in office hours about research assignments and how to conduct research.

31. *ALA Standards for Higher Education*, 11.

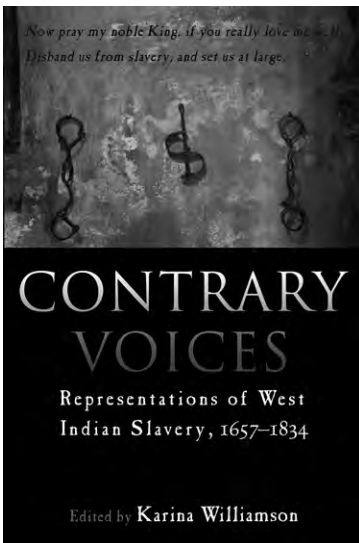
32. *ALA Standards for Higher Education*, 8.

33. For more about the structures and purposes of rubrics, as well as their strengths and weaknesses, see Heidi Goodrich Andrade, "Teaching with Rubrics: The Good, the Bad, and the Ugly," *College Teaching* 53, no. 1 (Winter 2005), 27-31.



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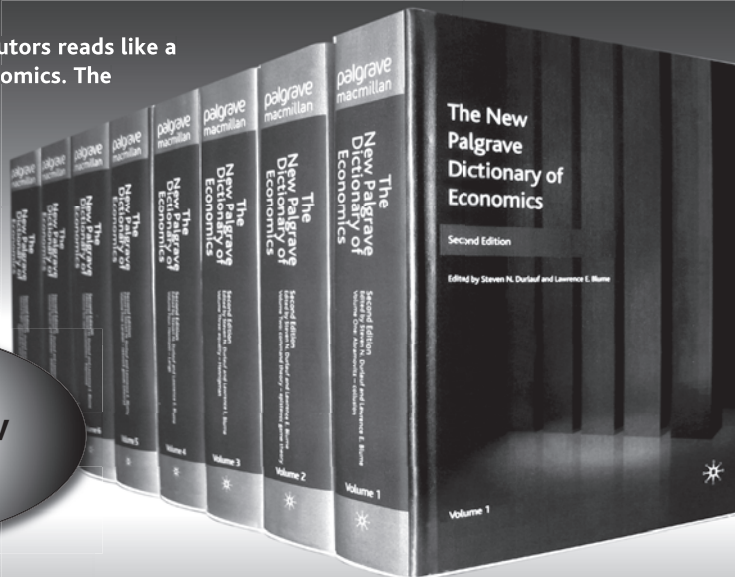
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