

Investigating the Practices of Student Researchers: Patterns of Use and Criteria for Use of Internet and Library Sources

VICKI TOLAR BURTON

Oregon State University

SCOTT A. CHADWICK

Iowa State University

For college writers, a key element of academic literacy is the ability to locate, select, evaluate, synthesize, and cite outside sources in their own writing. This study surveyed 543 college students to identify (a) their preferred criteria when evaluating Internet-based and library-based sources and (b) types of instruction students typically receive in evaluating those sources. Students writing research reports (63% of students) generally ranked most highly sources that were easy to use and easy to find, whether those sources were library-based or Internet-based ($r = 0.700, p < .01$). Nearly 60% of all students received library training, which came most frequently from high school teachers. Nearly 29% of all students received Internet training, which came most frequently from student peers.

bibliographic instruction critical thinking Internet Internet training information literacy
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For college writers, a key element of academic literacy is the ability to locate, select, evaluate, synthesize, and cite outside sources in their own writing. This traditional cornerstone of academic writing has been called into question, even endangered, by the nature and sheer number of resources available on the Internet and by students' apparently random selection and use of this and other borrowed information in their writing. Teachers across the curriculum complain that students fail to properly evaluate sources cited in their research, particularly those found on the Internet. Some students appear to grab the first 10 reasonably relevant items they encounter on the Internet or in the library, regardless of the authority or appropriateness of the sources. If, as Shirley Rose (1996) suggested, scholarly citation practices constitute academic courtship rituals, students' indiscriminate use of sources might be likened to academic promiscuity, a kind of textual sleeping around

Direct all correspondence to: Vicki Tolar Burton, Department of English, 125A Waldo Hall, Oregon State University, Corvallis, OR 97331. Email: <vicki.tolarburton@orst.edu>.

among whatever attractive sources can be easily picked up in chatrooms, databases, or stacks. Whether student researchers are choosing inappropriate sources due to lack of training, lack of time, lack of discretion, or for some other reason, the practice merits attention because it both devalues and places at risk a central assumption of academic writing: that a writer will support claims with appropriate, valid, and authoritative evidence.

Despite widespread scholarly interest in writing with computers, not enough researchers have followed Cynthia Selfe's (1989) suggestion that students be asked what strategies they actually use in writing with technology. We responded to the gap in knowledge about student practices by designing a survey that queries students regarding criteria they use to evaluate sources on the Internet and in the library. The general goals of this study are to identify students' preferred criteria when they evaluate research sources on the Internet, to compare these responses to criteria students prefer when evaluating library sources, and to ascertain what types of instruction students typically receive in evaluating library and Internet sources.

We come to this research from different fields: one of us from composition studies and a position directing a university-wide Writing Intensive Curriculum program, the other from Communication Studies with an emphasis on quantitative study of communication practices. We were drawn to this research by our common concern regarding student use of sources in research papers.

Because quantitative methodologies such as surveys of writers across the curriculum have not been favored in the field of composition and rhetoric, a rationale for the methodology may be appropriate. Although much scholarly investigation of student writing and research processes has employed qualitative research methods focused on small numbers of students in writing classes or students writing individually under controlled laboratory conditions, few studies have explored the benefits to be gained from quantitative approaches and from studying the writing practices of students in courses across the curriculum. Fred Kerlinger (1986) pointed out that quantitative methodology, in this case a large-scale survey, offers two distinct advantages. First, surveys allow the researcher to gather a large amount of data from a sample that can be generalized to a large population. Second, the data gathered from a properly designed and administered survey is quite accurate. Our use of a survey in this study allowed us to gather information from several hundred students, analyze that information, and then generalize our findings to students at similar universities. Studying the writing of students from many disciplines gives us the opportunity to learn more about writing practices large numbers of students employ when they write outside the composition class. Identifying the locations of relevant instruction students receive (or do not receive) may offer important clues to the use and misuse of borrowed information and suggest areas of writing instruction currently being ignored or overlooked. This study also offers important data on how student practices may vary from first-year to senior levels.

SCHOLARLY CONTEXT FOR THE STUDY

According to Gail Hawisher (1989), early research on computers and writing focused on "the effects of word processing on students and other writers, on the processes in which writers engage as they write, and on the products writers create with the aid of computers" (p. 45). Much recent scholarship on academic literacy, particularly including the use of

electronic media, has tended to be more theoretical than practical and contain more political analysis and calls for action than close study of student writing practices. For example, Cynthia Selfe and Richard Selfe (1994) drew from their own computer-related experiences and knowledge of common practices in English classrooms to reflect on how certain practices may be “contributing to a larger cultural system of differential power that has resulted in the systematic domination and marginalization of certain groups of students, including among them: women, non-Whites, and individuals who speak languages other than English” (pp. 48–49). The authors encouraged teachers to adopt a more critical view of the role of computers in the English classroom. Lester Faigley (1997) reviewed the history of the Internet and its connections to composition studies, suggesting that although computer use is leading to a renegotiation of traditional lines of authority in “electronic literacies” and is transforming writing and reading, it remains the task of the community of writing teachers to promote the good and just society based on social equality and (quoting Benjamin Barber), to “lift. . . the economic yoke from what were once known as the laboring classes;” (p. 41). Stephen Doheny-Farina (1996) shone a harsh spotlight on the supposed life-affirming assumptions of those he called “the techno-utopians” and argued for “ethical uses of [communication technologies]—such uses as those found within the civic networking movement” (pp. xii–xiii). These articles and others like them—particularly certain thematic issues of this journal¹—serve as important reminders of the politics of technology and writing.

Among scholars whose work focuses on student practices in writing with technology, two researchers in particular provide a context for our study. Cheryl Geisler (1994) developed the idea of the autonomous text, demonstrated how academic culture venerates and perpetuates that notion, and presented findings of a study of the writing processes of two Philosophy students, one a first-year student and one a graduate student. Geisler’s work contributes significantly to our understanding of how students develop views of authority in academic writing and how their views of authority affect the construction of texts, suggesting, for example, that the first-year student sees research as a search for facts, leaving authority unquestioned, whereas the graduate student sees his task as sorting claims of various authors. Christina Haas (1996) was interested in theorizing what she called *the Technology Question* by examining connections between cognition, writing, and the materiality of literacy. The “Technology Question,” Haas indicated, is: “What is the effect of writing and other material literacy technologies on human thinking and human culture?” (p. 3). Her research focus is, in part, on the effects of computer features (menus, scrollbars, etc.) on writing acts such as formatting, proofreading, reorganizing, and reading for a sense of the text. Haas did not directly address students’ evaluation or use of outside sources from either the Internet or the library, but her conclusion provides an important context for computer and Internet-related issues of authority and academic literacy. She argued that despite current discourse practices that portray technology as self-determining and a freestanding agent of change, “technologies do not make themselves, nor is their development accomplished in a vacuum” (p. 227). Students who view technology as self-determining and a freestanding agent may hesitate to question the

¹ Thematic issues of *Computers and Composition* include Electronic Portfolios (1996, 13[2]); Body, Identity, and Access: Diversity and Networked Environments (1997, 14[2]); Technical Communication Studies (1997, 14[3]), and others.

authority of sources they find on the Internet, just as believers in the autonomous text may hesitate to question sources in the library.

It is worth noting that the scant attention paid to writers' use of sources extends to textbooks.² Writing handbooks continue to contain chapters on the research paper, with most current editions acknowledging students' use of Internet as well as print sources in their research. Many handbook authors, however, update their texts for the computer age primarily by adding citation formats for electronic sources.³ Even among the burgeoning supply of Internet how-to guides marketed for writing students, a number of authors who minutely document every move involved in an Internet search tend to gloss over the critical thinking processes involved in evaluating research sources on the Internet and assume students will intuitively know how to assess the sources they find. Daniel Anderson, Benjamin Bret, Christopher Busiel, and Bill Paredes-Holt (1996) urged students to "be critical readers of the materials they retrieve from Internet browsing" and "choose selectively" (p. 112), but offered no criteria by which selections should be made. H. Eric Branscomb and Joseph Rivard (1997) provided ample guidance on finding information on the Internet but none on evaluating what is found. Eric Crump and Nick Carbone (1997) seemed concerned primarily with determining the stability of sources and with copy and paste plagiarism. Martin Irvine (1997) said, "the important thing to learn is how to find what we're looking for without wasting time" (p. 57) and did not waste time telling students how to evaluate what he has helped them find. Randy Reddick and Elliot King (1996) advised students to "winnow your material and clarify the points you want to make" (p. 176), suggesting that they bounce ideas around in an online discussion group. No other evaluation criteria are suggested.

Some Internet guides do address evaluating sources. Andrew Harnack and Eugene Kleppinger (1997) noted the "democracy" of the Internet (which students are likely to see as a positive value) but do warn that "there are few, if any, standards regarding what may be published on the web" (p. 53). Although their main focus is on stabilizing the location of a source, they do suggest criteria by which students may evaluate sources: authorship, publishing body, referral to other sources, accuracy or verifiability, and currency. Eric Branscomb (1998) provided a case study evaluating sources on an environmental topic but did not generalize the principles of evaluation. Carol Clark (1997) suggested that students examine Web sources for balanced reporting of evidence, bias, resources cited, authorities cited, and sponsor of the site. William Condon and Wayne Butler (1997) provided the most extensive (and most rhetorically based) instruction on evaluating sources among guides reviewed for this study, including detailed writing assignments designed to teach students to evaluate Internet sources and annotate their findings to share with others.

² Recent research in library and information sciences journals has paid little attention to information-seeking behavior of college students. A few studies have contributed to the body of knowledge on this question: Barbara Fister (1992) and Barbara Valentine (1993) used focus groups and/or interviews to identify research strategies used by successful student researchers; Constance Mellon (1986) used student journals to examine "library anxiety"; Carol Kuhlthau (1988) used case studies and other written documents to look at cognitive aspects of library research.

³ A notable exception is Lisa Ede's (1998) *Work in Progress*, 4th edition, which addresses not only the evaluation of Internet sources but also many other uses and issues of electronic media and writing.

In addition to handbooks and Internet guides, college and university libraries routinely provide guidance on how to evaluate Web pages. This guidance is sound and useful to students but often is not in line with traditional evaluation techniques used by researchers to determine the authority of a text. For example, Ann Scholz (1996) provided an Internet evaluator checklist that focuses on the author, the location of the Web page, the currency of the page, the intent of page, and the appropriateness of the page for the reader's goals. Other libraries take the who (is responsible for the page), what (is the purpose of the page), when (was the page written), and how (accurate, thorough, and easy to use is the page) approach (Lindstrom, 1998). Similarly, Esther Grassian (1998) suggested the reader focus on three areas: content and evaluation, source and date, structure, and other user-specific needs satisfied by the Web page (see also Ciolek, 1996; Smith, 1998).

One reason, of course, that academic literacy in general and students' use of sources in particular have received little recent scholarly attention is that there is substantial disagreement within the field of composition studies as to whether writing teachers should prepare students explicitly for writing in the academy, with resistance to doing so based in part on the lingering suspicion that if writing teachers take on the task of training students as academic writers, composition courses will be seen merely as service courses, losing institutional status for the courses and their instructors. At the same time scholars like David Bartholomae (1985) have explored the plight of the uninitiated student struggling daily to invent the university through discourse, others (Larson, 1982; North, 1980) have argued that it is not, in fact, the responsibility of the composition instructor to teach the research paper or research skills at all—that task properly lies with faculty in the disciplines. Although Charles Bazerman's (1988) work on how disciplinary communities shape discourse supports this view, Kurt Spellmeyer (1989) argued that teaching students the writing moves and conventions of a particular discipline does not empower students but instead encourages a kind of submissive accommodation to the constraints and power structure of the field and may deprive students of developing "authentic voices" (1993, p. 38). Brian Sutton (1997), analyzing these arguments and the issues and politics of teaching the research paper, concluded that first-year writing courses should not attempt to instruct students in the specifics of research writing in various disciplines but should, as Bazerman (1995) noted, be "primarily concerned with helping students to read and critically consider research-based academic writing, and only secondarily concerned with helping them to produce such writing, and to conduct the research which precedes it, themselves" (Sutton, 1997, p. 54). Fold into this context of uncertainty postmodern attempts (Barthes, 1979; Foucault, 1977) to erase the author, unseat authority, and destabilize text, along with the questionable status of intellectual property (see also Lunsford, 1996), and it is little wonder there is a gap in knowledge about evaluating sources.

THE STUDY

This study seeks to increase our understanding of authority in academic literacy and contribute to knowledge of writing practices beyond the composition classroom. This leads to our first research question:

- RQ1: Are students writing papers in their college classes? If so, what genres are most frequently assigned?

Moving beyond understanding writing practices in the composition classroom brings into play the notion of training students to evaluate library and Internet sources. No existing data reports how many students receive evaluation training, either in total numbers or as a percentage of total students. Similarly, data explaining where such training comes from is lacking. Thus, we ask:

- RQ2: What percentage of students have received training in evaluating library or Internet sources and from whom?

Though it seems reasonable to assume that students will conduct research beyond their course textbook, it is not known if students do so. Further, it is not known what percentage of students uses the library, the Internet, or some combination of the two to conduct that research. This leads to our asking:

- RQ3: Of those students who wrote a college paper in the last year, what percentage of them used the library and/or the Internet to conduct research for that paper?

Based on answers to the previous questions, we can determine if a relationship exists between evaluation training of library and Internet sources and the use of the library and/or Internet for research:

- RQ4: What is the relationship between library and Internet training and actual use of the library and Internet?

That leaves our most important question:

- RQ5: What criteria do students use when they evaluate library-based and Internet-based sources?

METHOD

Participants

The 543 participants in this study consisted of undergraduate ($n = 503$), graduate ($n = 19$), and other ($n = 21$) students at a medium-sized western university. Of the 503 undergraduate students, 87 were first-year, 110 were sophomores, 106 were juniors, and 200 were seniors. Six of the first-year students and one sophomore were 17-years-old and removed from the study due to lack of prior parental consent for their participation. Eligible participants' ages ranged from 18 to 44 ($M = 21.13$, $SD = 3.51$). The survey was conducted during the middle of the fall term. No students asked to complete the survey refused to do so.

Students were enrolled in courses, both required and elective, across the curriculum. Students from 97 majors were represented, with Business Administration, Animal Science, and Exercise and Sport Science represented most frequently with 45, 42, and 40 students, respectively. Participants volunteered for the study and were free to withdraw from the study without penalty at any time. No participants received course credit or other incentives for participating. Surveys were not distributed in the researchers' classes.

Survey Construction

The survey was constructed in several steps. First, we gathered guidelines for evaluating library-based sources from writing manuals published pre-Internet.⁴ These manuals were selected based on several factors: (a) the use of writing theory in making evaluation guidelines, (b) the scholarly reputation of the author(s), and (c) the pervasive use of those manuals in colleges. All guidelines specifically stated in a manual were gathered. Where multiple manuals articulated the same, or similar, guidelines we listed them only once in the survey. The lists of guidelines were converted into survey questions for evaluating sources from the library and from the Internet. Using those same guidelines throughout the survey, but changing the wording to adapt them to Internet-based sources, allows a comparison of students' source evaluation behavior between library-based sources and Internet-based sources. All survey questions were worded, "When evaluating whether you will use a library source for this paper, how important to you is it that X?" (e.g., "How important to you is it that the source provides external support?"). Wording was adjusted for Internet sources. Although not "established measures" as Earl Babbie (1992) described them (p. 131), using established guidelines does suggest reliability in the questions based upon those guidelines.

The second step in survey construction involved showing the initial survey to 12 faculty members attending a Writing Intensive Curriculum seminar. The faculty were asked to evaluate the validity of the questions based on the guidelines they used in teaching students to evaluate source authority. Survey questions were retained if 100% of the faculty agreed that the guideline behind the question was valid. For those questions gaining less than 100% faculty agreement upon their validity we engaged the faculty in focus group-like discussions to flesh out the reasons for the disagreements. When the faculty discussed the disagreements and found their differences to be semantic and not substantial, we retained the question. When differences remained, the questions were dropped from the survey.

Additional survey questions pertaining to the types of papers written by students were constructed based on the authors' teaching experience and feedback from professors who reviewed the pilot survey. Students were asked to "select the class paper you most frequently write in your academic major." Choices were: "review of academic research; a paper whose purpose is to advance and argue a position; case study analysis; journal/log of your reaction to readings; investigative report; research report; other (please describe)."

Next, the survey was piloted using 60 students. Students were requested to make suggestions and mark all ambiguous or confusing questions. Students did so and also suggested criteria they used that did not appear on the survey. The surveys were updated with those changes, then presented to a second set of faculty attending a different Writing Intensive Curriculum workshop and to 20 of the university's library professionals. The same process of determining the validity of the questions was used as described above. Appropriate changes were made. This procedure of generating questions from scholarly

⁴ Rise Axelrod and Charles Cooper (1991); Sheridan Warner Baker (1991); Bazerman (1995); Jules Benjamin (1994); Wayne Booth and Marshall Gregory (1987); Rebecca Burnett (1990); Bonnie Carter and Craig Skates (1993); Toby Fulwiler (1991); Richard Gebhardt and Dawn Rodrigues (1989); Nancy Sommers and Linda Simon (1993); Kristin Woolever (1991).

Table 1
Genre of Paper Written Most Frequently in the Major and Type of Sources Used

Genre Assigned Most Frequently in the Major	Students Using Textbooks Only	Students Using Outside Sources	All Genres Total (%)
Research report	10	286	296 (65.5)
Argument/position paper	7	49	56 (12.3)
Review of academic research	1	31	32 (7.0)
Journal/reading log	3	25	28 (6.1)
Case study analysis	2	25	27 (5.9)
Other	0	7	7 (1.5)
Investigative report	0	6	6 (1.3)
Total	23	429	452 (100)

sources, and then making adjustments to the survey questions based on faculty and student input, helps make the case that the survey has content validity. In Babbie’s (1992) words, it “covers the range of meanings included with the concept” of source evaluation of written material (p. 133). The final survey was presented to the sample of 543 students.

Procedures

The authors used a snowball sampling technique to gain access to students across the university. Each of us requested access to classes of colleagues across the university. Then we asked for additional names of faculty known by those colleagues. Inquiries were made to those faculty. This snowballing process continued until no new faculty names were suggested. The sampling method was used in an attempt to prevent us from using students from a limited section of the university. The sampling methods allowed us to request access to students from more than 60 faculty members across the campus. Access was granted to approximately 20 classes. Although not a random sample, the sampling technique used allowed us access to students in 97 different majors, providing access to students across the entire university.

In each class, one of us read an informed consent document to the students, briefly explained the survey, and then distributed the surveys to the students. That person remained in the room to answer any questions the students had. Once all students completed the survey, we collected the surveys, debriefed the students, and then answered any questions.

RESULTS

Research Question 1

The results indicate an overwhelming number of students are writing college papers. Four hundred fifty-two students (91.1% of valid undergraduate survey respondents) reported having written a paper for a college class in the last year. Of those, 429 students (94.9%) wrote a paper that required them to research sources outside their course textbooks. When asked to identify the paper type they most frequently wrote in their major, students identified the research report (see Table 1). The distribution of paper types is not

Table 2
Number of Undergraduate Use of Sources by Academic Classification

Class	Wrote No Paper	Used Textbook Only	Used Outside Sources	Total
First-year	31	11	39	81
Sophomore	6	4	99	109
Junior	4	4	98	106
Senior	3	4	193	200

statistically significant across all papers, $X^2_6 = 11.25$, $p = .081$, but it is significant when we look at only those papers using sources outside the course textbook, $X^2_6 = 982.31$, $p < .01$.⁵

There also exists a significant difference of sources used across academic classification, $X^2_3 = 32.021$, $p < .001$ (see Table 2).

Research Question 2

The first part of the second research question addressed what types of training in evaluating sources students received. Table 3 details the percentage of subjects who received training by academic classification. There existed no significant training differences by academic classification.

The second part of the second research question concerned from whom students received source evaluation training. Regardless of who provided the training, as many or more students received library training from that provider than received Internet training from that same type of provider. For example, 39% of students received library training from a high school teacher, whereas only 3% of those students received Internet training from a high school teacher (see Table 4). When compared across academic classifications, a few significant differences in category of training providers exist, yet no pattern of difference is evident.⁶ The wording of the survey question asked students to identify all persons who provided them source evaluation training. As a result, percentages in Table 4 do not add to 100% because many students received training from multiple providers.

Research Questions 3 and 4

Research question three asked what percentage of students who wrote a college paper that required research sources outside the course textbook used the library and/or the Internet

⁵ In other words, the distribution of all papers written is not far from what is statistically expected. However, when we look only at papers written using sources outside the course textbook we see a substantially larger than expected number of research reports. That makes that distribution statistically significant.

⁶ A greater percentage of first-year students received library training from high school teachers ($O2_3 = 9.101$, $p = .028$) and librarians ($O2_3 = 12.861$, $p = .005$) and Internet training from high school teachers ($O2_3 = 14.831$, $p = .002$) than did other students. A greater percentage of juniors and seniors received library training from professors than did first-year and sophomore students ($O2_3 = 9.666$, $p = .022$).

Table 3
Percentage of Students with Training in Evaluating Sources by Academic Classification

Type of Training	First-Year	Sophomore	Junior	Senior	All
Library training only	35.6	29.3	32.4	35.2	33.5
Internet training only	4.6	2.8	2.8	2.0	2.6
Library and Internet training	31.0	22.9	30.5	24.1	26.3
No training	28.8	45.0	34.3	38.8	37.6

to conduct research for that paper. The results show that although 225 of the students (52%) used both the library and the Internet, only 90 students (21%) exclusively used the library, and only 90 students (21%) exclusively used the Internet. Twenty-four students (6%) used neither the library nor the Internet, though their assigned paper required outside research.

Research question four addressed the relationship between library and Internet training, and actual use of the library and Internet. Of the students who wrote a college paper that required them to research sources outside of the course textbook in the last year, most who received training of some sort used the library and the Internet (see Table 5).

Research Question 5

Research question five addressed how students evaluate library-based and Internet-based sources. Table 6 provides the rank for all evaluation criteria when evaluating library sources or Internet sources. Research report writers showed significant agreement in the order in which they ranked library source evaluation criteria and Internet source evaluation criteria ($r = 0.700, p < .01$).

DISCUSSION

This study contains a number of results important for teachers of writing at secondary and college levels, for secondary and college librarians, for teachers across the curriculum who

Table 4
Percentage of Students Receiving Library and Internet Source Evaluation Training from Various Categories of Providers

Category of Training Provider	Students Receiving Library Training	Students Receiving Internet Training
High school teacher	39	3
High school librarian	37	1
College librarian	29	4
College professor	27	16
Student peer	27	17
College library student worker	20	4
College computer lab worker	11	8
College teaching assistant	7	6
A book	5	4
Other	5	5

Note: Some students received training from more than one source.

Table 5
Comparison of Training and Actual Use of the Library or Internet

Type of Training Reported by Students	Students Receiving Training <i>n</i>	Students Who Did Library Research %	Students Who Did Internet Research	Students Who Did No Research %
Library training only	140	71	66	7
Internet training only	12	83	58	0
Library and Internet training	107	72	77	7
No training	170	75	79	2
Total	429	73	73	6

assign writing, and for researchers in composition and communication. These can be discussed under the categories of the nature of writing assignments, the training of students in evaluating sources, student use of library and Internet sources, and student criteria for evaluating library and Internet sources.

The Nature of Writing Assignments

Most students surveyed (91.1%) had written at least one paper in the past year. Though a modest claim at best, this statistic does contradict the suspicion among employers,

Table 6
Ranking of Criteria Used by Students to Evaluate Sources (Research Papers)

Evaluation	Ranking When Evaluating Library Sources	Ranking When Evaluating Internet Sources
Source is available	1	3
Source is easy to understand	2	1
Source uses up-to-date facts	3	6
Sources uses primary sources	4	11
Source is easy to find	5	2
Source provides external support	6	10
Date of publication of source	7	8
Source is written in a professional style	8	12
Source uses graphics	9	7
Reputation of publication	10	5
Source avoids using secondary sources	11	15
Credentials of the author of the source	12	17
Source uses original arguments	13	9
Source has been cited by others	14	23
Source gives citations for its own sources	15	21
Title of the source	16	18
Quantity of relevant information in index	17	14
Source cites others	18	4
Source shares your view on topic	19	16
Source's view on topic differs from yours	20	20
Source is peer reviewed	21	13
Reputation of source's publisher	22	22
Number of times checked out/hits	23	19

parents, critics of higher education, and media that university students are no longer required to write papers.

The most frequently assigned genre of paper across disciplines at the university level is the research report. Thus, rumors of the death of the research report, or term paper, are decidedly premature. In fact, 66% of students who wrote papers using outside sources, and 63% of those who wrote papers of any type, stated that the most frequently assigned genre in their major (97 majors represented) is the research report. The most frequently used writing assignments, across disciplines and across genres, require the use of sources beyond the course textbook.

The significant difference of outside papers written by each academic class shown in Table 2 can be attributed to the relatively large number of first-year students who write papers based on readings in their textbooks.

Training of Students in Evaluating Sources

A majority (57.6%) of university students have received at least some training in evaluating library sources, but a substantial minority (42.4%) report having had no such training, either at the high school or college level. Only about one-third of university students have received training in evaluating sources on the Internet, leaving a surprising two-thirds of students untrained and presumably inventing their own criteria of evaluation. Although the largest segment of students trained in the Internet was trained by a peer (17%), a nearly equal number were trained by a college professor (16%). Only 38% of students report receiving training in Internet sources from any person or location in the university system (professors, graduate teaching assistants, librarians, library student workers, or computer lab workers). The fact that teachers are assigning research reports without giving instruction in source evaluation may be indicative of the belief among many teachers across the disciplines that they are not responsible for teaching students how to conduct research. Teachers may believe instead that responsibility falls in the domain of the English Composition program. In fact, at the university where students were surveyed, the research paper is not part of the first-year composition course, and, thus, no source evaluation training is provided in first-year composition. This points out the importance of faculty across the curriculum being informed of what training they can reasonably expect student to have on completion of first-year composition. It also indicates the need for instruction in source evaluation across the curriculum.

Student Use of Library and Internet Sources

Of students who wrote papers using library and/or Internet sources, slightly over half (52%) used both Internet and library sources. Only about one-fifth (21%) used library sources exclusively, and only about one-fifth (21%) used Internet sources exclusively. To put it another way, approximately 73% of student researchers used library sources, and about 73% used Internet sources. This data contradicts the lore among teachers that most university students are now avoiding library research altogether. Conversely, it also indicates that teachers assigning research papers need to be aware that a significant majority of students will seek sources on the Web as well as in the library. The days of that genteel genre, "the library paper," are over.

Students with both library and Internet training used both types of resources, with a slight preference for Internet sources. This seems logical, and might indicate a general confidence among students who are trained in research strategies. Students with only one type of training reported more library use than Internet use, even if the only training they had was Internet training. Conversations with university librarians suggest that this may be because students are often told during Internet training to be wary of Internet sources. Students may become so wary that they decide to use library sources, thinking them more acceptable to their professor. Internet training may also make them realize how tricky citation of Internet sources can be because dates, authors' names and affiliations, and sponsorship of the Web site may not be evident. Thus, library sources may seem safer.

Students with no training in evaluating sources showed a slight preference for Internet research (79%) over library research (75%), but used the Internet significantly more than students with Internet training but no library training.

Student Criteria for Evaluating Library and Internet Sources

Students use a kind of logic in evaluating both Internet and library sources. With a few exceptions, students appear to transfer evaluation criteria they learned for one type of source to the other. As Table 6 shows, the degree of agreement in the evaluation criteria ratings for writers of research reports, for the library and for the Internet, was extraordinarily high ($r = 0.699, p < .001$). Post hoc analysis revealed that the degree of agreement in evaluation criteria ratings across all paper types was also significant ($r = 0.614, p < .01$). The reported correlation suggests that students use largely the same source evaluation logic when writing research papers—regardless of whether they are considering library-based sources or Internet-based sources. Where differences occur, the differences in source evaluation criteria appear to be based on specific characteristics of the Internet, such as citing others.

The fact that students transfer source evaluation criteria across media suggests that some training is better than no training and that students gain from evaluation training beyond the specific situation in which they were trained. However, this transfer practice also raises the possibility that students may transfer criteria from one medium to another without understanding significant differences among various types of sources or media.

What makes a source most desirable to student researchers? Access, access, access. Drawing from the data in Table 6, "source is easy to understand," "source is easy to find," and "source is available," are the top three criteria for Internet sources, and three of the top five for library sources, indicating that accessibility—both physical and cognitive—is primary for students. This high priority given to ease of access helps to explain teachers' impressions that student researchers are practicing a kind of textual promiscuity referred to in our introduction. When students seem to use sources without discrimination, they are probably using what is most accessible. Although Rose (1996) suggested that we teach "scholarly citation as a courtship ritual designed to enhance a writer's standing in a scholarly discourse community" (p. 34), the truth is that, for many students, the assigned research report is more like a one-night stand (sometimes literally) than a courtship. They do not have the personal investment in their topic or even their discipline that a professional in the field would have. For most students, there will be no second date; thus, the high priority on ease of access. To a degree, this supports Barbara Valentine's (1993)

finding that students she interviewed tended to use what came to hand first: books and bibliographies from professors, textbooks, research from other papers, books from their own libraries. However, Valentine's list of most-accessible sources suggests a preference for familiar sources for which no real search is required rather than accessible but unfamiliar sources.

Students do report placing a high value on other characteristics beyond accessibility. They value up-to-date or recently published information over older information, as indicated by the top-eight ranking given to "source uses up-to-date facts" and "date of publication." Apparently, the message that recent information is more valuable than outdated information has gotten through to students. Time of publication is also a category of evaluation that is fairly easy to determine: students can look at the publication date of the book or journal, the most recent revision date on a Web site, and they can check for dates in other documentation in a document.

The third general category of evaluation criteria valued highly by students is the use of external support, particularly from primary sources. Students ranked use of "primary sources" fourth for research papers using library sources and eleventh for research papers using Internet sources. This parallels their sixth-place ranking of "provides external support" for library sources and tenth-place for Internet sources. We were frankly surprised that most students claimed to know what primary and secondary sources are; almost no students selected the option, "I do not know what is meant by primary sources." Discussions with colleagues, including librarians, indicate that the meaning of the terms "primary sources" and "secondary sources" may vary across disciplines and even within disciplines, depending on the researcher's topic. For example, in literary studies, *Ulysses* by James Joyce would be considered a primary source and a scholarly critical article about the novel a secondary source, unless one is conducting research on literary criticism as a genre, in which case the critical piece might be a primary source. In the hard sciences, a primary source is the original research. A secondary source summarizes or discusses the primary research. Despite potential for confusion, students claim to understand the value of primary sources.

A fourth category of evaluation that merits attention is how important students believe the reputation of the publication, the author, and the publisher to be. Students ranked "publication's reputation" quite high (fifth) for Internet sources and somewhat lower (tenth) for library sources. They ranked "author's credentials" twelfth for library sources and seventeenth for Internet sources. "Publisher's reputation" ranked near the bottom (twenty-second) for library and Internet sources. Although it might seem contradictory that students would rank the reputation of the publication high but that of the publisher low, this may again reflect how easily students can evaluate this area. They may recognize a journal in their field, for example *Human Communication Research* or *PMLA*, as being highly reputable, but find knowledge of publishers (e.g., the preference in some fields for university presses over well-known commercial presses) more elusive.

Peer review occupies an odd place in student evaluation criteria, especially considering the high premium placed on it by the academy. Students ranked "peer reviewed" thirteenth for Internet sources but nearly last (twenty-first) for library sources. As with "primary sources," few students stated that they did not know what "peer reviewed" means. The common usage of the term "peer review" in first-year composition and in writing-intensive courses across the curriculum might mean students believe a peer-reviewed

article to be one upon which the writer has received informal feedback from other writers, rather than one that has undergone close scrutiny by experts in the field. Given the high priority given to peer review in evaluating faculty research for professional advancement, students' low regard for it may indicate a gap in their understanding of how knowledge is produced and evaluated in the academy.

Surprisingly, the use of graphics ranked only slightly higher (seventh) as a criterion for Internet sources than for library sources (ninth). For library sources, students valued "written in a professional style" (eighth) several steps above the ranking for Internet sources (twelfth). The valuing of professional style suggests that students do discriminate between texts written in a popular style and those written at a more professional or scholarly level.

Although Stephen Stoen (1994) has argued that faculty researchers across the disciplines locate sources through scholarly citations in books and journals, students do not appear to realize fully the importance of citations. In this study, students ranked "gives citations" fifteenth for library sources and twenty-first for the Internet, and ranked "has been cited by others" fourteenth for the library but dead last (twenty-third) for the Internet. This finding probably indicates that students do not use bibliographies as a means of finding other related sources. This finding may indicate that they do not know that this is a good search strategy or that they do not know how to follow leads in a bibliography. Having been "cited by others" may rank so low for the Internet, because once a person is at a Web site, the fact that others cite it seems like useless information. For example, if students came from a Web page that linked to the present Web page, then knowledge of that link may no longer seem useful. An electronic link may also lack the authoritative value of an article cited in a refereed journal article.

It is interesting that some students reported having written a paper that required them to research sources outside of the course textbook but then said they did no research using the library or Internet. There are a number of possible interpretations of this response beyond the most cynical, that somehow these students made up their research data or used a paper written by someone else. In fact, the question added the qualification: "Consider a library source to be any non-Internet based book, journal, magazine, and so forth, that exists in the Valley (Kerr) Library."⁷ Some students may have interpreted this to mean that if they did research in another library, they should not complete the library section of the survey. Also, some departments on the campus maintain collections of scholarly and professional journals in the department that students might use but not consider library sources because the collections are not housed in the university library. In other cases, professors may make copies of scholarly articles available to their students. In certain courses outside sources might include interviews with authorities in the field or with nonauthorities (family members, students in a certain major, working mother, etc.); student-conducted surveys; data gathered from watching television, films, or a video; and research gathered in field exercises or lab experiments—just to name a few nonlibrary, non-Internet sources for student research.

⁷ Valley (Kerr) Library is the name of the library on the campus on which the study was conducted.

Limitations of the Study

This study is limited in that it used subjects from only one institution, a research-oriented university. This may present a problem when applying the findings of this study to students at nonresearch-oriented institutions, especially if students at those institutions are fundamentally different from the students used as subjects in this study. We do not automatically expect that to be the case. It is more likely that the types of papers assigned to students would be different, or at least form a different distribution, than the assignments we encountered. The high degree of correlation among the evaluation criteria across all paper types suggests that a different mix of papers would not limit this study's generalizability.

A second limitation is that differences in library and Internet training are institutional and based on a number of issues, including availability of training workshops, online tutorials, and computer terminals; willingness of instructors to allow librarians class time for face-to-face instruction; and willingness of instructors to address issues of source evaluation with students.

Another limitation of the study is that change occurs quickly in all aspects of electronic communication and that some aspects of our study may seem dated by the time it reaches publication. We suggest that this survey represents a snapshot at a particular moment of the 1990s, a snapshot worth regarding. Although student responses in our study may differ from student responses in 5 or even 3 years, our study provides a base of information on student evaluation of electronic and library sources, a base upon which other researchers can build. Will the frequency and type of source evaluation training change? Will students continue to prefer sources with easy access? These are questions for future study.

CONCLUSIONS FOR TEACHING AND DIRECTIONS FOR FURTHER RESEARCH

It is appropriate to acknowledge that what some teachers see as irresponsible use of sources, others may call textual freedom. Just as in the early days of the World Wide Web many users considered—and reveled in—the Web as a sort of electronic Wild West, a frontier with no rules, so we can expect some students and others to argue that, in fact, the nature of electronic source material will force academic literacy to change, to loosen up, to let go of the obsession with authority and citation. To what degree this loosening up takes place in the future is an area for investigation.

Nevertheless, our research indicates that although compositionists argue that the research paper has lost its place in the academic sun, faculty in other disciplines continue to assign research papers, assuming students are learning to evaluate sources in their English classes—or somewhere. In addition, students continue inventing the process and genre of the documented paper with their use and abuse of sources.

Therefore, we would argue that if teachers want student writers and researchers to stop using sources irresponsibly or inappropriately, they must take responsibility for training students in strategies of critical evaluation and urge colleagues across the curriculum to do the same. To expand on Rose's (1996) idea of scholarly citation as courtship, this is the time to teach students about "safe text." As is already happening at many institutions, faculty can team with librarians to train students in conducting smart searches, getting to

know the textual history of their sources, particularly of Web sites they are using as sources. The parallel with safe sex not only works metaphorically, but might also help students remember important questions to ask of their sources: What is the textual history of this Web site? Who pays the rent? How might that association add to or taint the authority of my argument? How will using this source affect the health of my argument? Is this a source worth spending my time with? Can I trust this source to tell the truth? How are its claims supported? Could I do better if I searched a little more instead of settling for the easy hit?

At the same time that composition studies as a field seems fully engaged with the possibilities of technology and writing (approximately 150 sessions at the 1997 Conference on College Composition and Communication were on computer-related topics), many of us may be less eager to make room in our own courses and in the writing programs we administer for instruction in this aspect of the basics of academic literacy. We may be as likely as our colleagues across the curriculum to claim that we have too much material to cover to add one more thing. But, as many teachers have already discovered, there are ways to structure writing assignments so students are not conducting their research at the last possible moment. The fact that librarians and information services staff at many institutions, large and small, are working to improve training for students in evaluating sources invites us to learn about available training, draw our students into the training, and evaluate the effectiveness of training workshops or online tutorials in terms of writing and learning outcomes. This is a clear site for further study.

We believe that faculty across the curriculum must address the issues of training students in how to conduct research and shape research tasks that lead students away from the one-night-stand research paper. As one of the reviewers of our article suggested, "The key issue to me is whether anyone takes the time to help students work through their thinking and investigation of a topic. Until faculty believe that the discovery of knowledge matters more to a student's learning than the regurgitation of previously discovered knowledge, we will make little progress." Until these issues are addressed, we can produce guideline after guideline for evaluating sources in the library and on the Internet, and little will change.

Our findings have broadly suggested some of the problems that exist in the ways students evaluate sources. Areas for future research abound:

- Similar surveys conducted at institutions other than Research I universities and at institutions without well-developed WAC programs are needed to determine if institutional context creates differences in categories of the survey, including types of writing assigned, use of library and Internet, locations of training, and students' criteria for evaluating sources.
- Qualitative studies can look at classrooms and students to expand understanding of how students evaluate and use sources when addressing various assignments. What characteristics identify assignments that effectively lead students to thoughtful consideration and use of sources? What training in source evaluation is most effective: classroom, library, or both?
- Quantitative and qualitative studies can be undertaken to look at how research writing is actually taught in the classroom; the amount of time spent teaching students how to do research; the time spent developing the topic, evaluating sources, drafting, revising.

- Qualitative studies can also examine how teachers conceptualize their own disciplines, how the teachers' conceptualizations reflect what counts as proof in the discipline, how these criteria are conveyed to students, and how they affect students' use of sources.
- It is also important to track changes in student evaluation behavior over time. We might predict that more and more students will arrive in our classes as skilled researchers on the Web and in the library, but further studies will be required to measure the accuracy of this prediction.

We end with a call for researchers in composition studies to turn some of our electronic and intellectual energy toward developing a theory and pedagogy of source evaluation that will help students across the disciplines embrace the idea that careful evaluation of research sources is vital to their construction of healthy arguments, healthy writing, and healthy academic lives.

Vicki Tolar Burton is an associate professor of English at Oregon State University, where she directs the Writing Intensive Curriculum. Burton's research interests include Writing Across the Curriculum and eighteenth century rhetoric. Her recent publications have appeared in *College English*, *Rhetoric Review*, and several edited collections.

Scott A. Chadwick is an assistant professor in the Greenlee School of Journalism and Communication at Iowa State University. Chadwick's research focuses on the use and efficacy of communication technologies in learning. His recent work has appeared in *The Electronic Journal of Communication* and *The Speech Communication Teacher*.

REFERENCES

- Anderson, Daniel; Bret, Benjamin; Busiel, Christopher; & Paredes-Holt, Bill. (1996). *Teaching on-line: Internet research, conversation and composition*. New York: HarperCollins.
- Axelrod, Rise B., & Cooper, Charles P. (1991). *The St. Martin's guide to writing* (3rd ed.). New York: St. Martin's.
- Babbie, Earl. (1992). *The practice of social research* (6th ed.). Belmont, CA: Wadsworth.
- Baker, Sheridan Warner. (1991). *The practical stylist with readings* (7th ed.). New York: Longman.
- Barthes, Roland. (1979). The death of the author. In Stephen Heath (Ed. and Trans.), *Image-music-text*. Fontana: Editions du Suil. (Reprinted 1988. In David Lodge (Ed.), *Modern criticism and theory*, pp. 167–172. New York: Longman)
- Bartholomae, David. (1985). Inventing the university. In Mike Rose (Ed.), *When a writer can't write: Studies in writer's block and other composing process problems* (pp. 278–285). New York: Guilford Press.
- Bazerman, Charles. (1995). *The informed writer: Using sources in the disciplines* (5th ed.). Boston: Houghton Mifflin.
- Bazerman, Charles. (1988). *Shaping written knowledge: The genre and activity of the experimental article in science*. Madison, WI: University of Wisconsin Press.
- Benjamin, Jules R. (1994). *A student's guide to history* (6th ed.). New York: St. Martin's.
- Booth, Wayne C., & Gregory, Marshall W. (1987). *The Harper and Row rhetoric*. New York: Harper and Row.
- Branscomb, H. Eric (1998). *Casting your net: A student's guide to research on the Internet*. Boston: Allyn and Bacon.

- Branscomb, H. Eric, & Rivard, Joseph D. (1997). *Allyn and Bacon quick guide to the Internet for college composition*. Boston: Allyn and Bacon.
- Burnett, Rebecca. (1990). *Technical communication* (2nd ed.). Belmont, CA: Wadsworth.
- Carter, Bonnie, & Skates, Craig. (1993). *The Rinehart handbook for writers* (3rd ed.). Fort Worth: Harcourt Brace.
- Ciolek, T. Matthew (1996). The six quests for the electronic grail: Current approaches to information quality in WWW resources. *Review Informatique et Statistique dans les Sciences Humaines*, 1–4, 45–71. Available: <http://www.ciolek.com/papers/quest/questmain.html> [Accessed: August 12, 1998].
- Clark, Carol Lea. (1997). *Working the Web: A student's guide*. Austin: Harcourt Brace.
- Condon, William, & Butler, Wayne. (1997). *Writing the information superhighway*. Boston: Allyn and Bacon.
- Crump, Eric, & Carbone, Nick. (1997). *English online: A student's guide to the Internet and World Wide Web*. Boston: Houghton Mifflin.
- Doheny-Farina, Stephen. (1996). *The wired neighborhood*. New Haven: Yale University Press.
- Ede, Lisa. (1998). *Work in progress* (4th ed.). New York: St. Martin's.
- Faigley, Lester. (1997). Literacy after the revolution. *College Composition and Communication*, 48(1), 30–43.
- Fister, Barbara. (1992). The research processes of undergraduate students. *Journal of Academic Librarianship*, 18(3), 163–169.
- Fulwiler, Toby. (1991). *College writing*. Portsmouth, NH: Boynton/Cook.
- Foucault, Michel. (1977). What is an author? (Josue V. Harari, Trans.). In Josue V. Harari (Ed.), *Textual strategies: Perspectives in post-structuralist criticism*. Ithaca, NY: Cornell University Press. (Reprinted in 1988. In David Lodge (Ed.), *Modern criticism and theory*, pp. 197–210. New York: Longman).
- Gebhardt, Richard C., & Rodrigues, Dawn. (1989). *Writing processes and intentions*. Lexington, MA: Heath.
- Geisler, Cheryl. (1994). *Academic literacy and the nature of expertise: Reading, writing, and knowing in academic philosophy*. Hillsdale NJ: Erlbaum.
- Grassian, Esther. (1998). UCLA college library instruction: Thinking critically about World Wide Web resources. Available: <http://www.library.ucla.edu/libraries/college/instruct/web/critical.htm> [Accessed: October 12, 1998].
- Haas, Christina. (1996). *Writing technology: Studies on the materiality of literacy*. Mahwah, NJ: Lawrence Erlbaum.
- Harnack, Andrew, & Kleppinger, Eugene. (1997). *Online! A reference guide to using Internet sources*. New York: St. Martin's.
- Hawisher, Gail E. (1989). Research and recommendations for computers in composition. In Gail E. Hawisher & Cynthia L. Selfe (Eds.), *Critical perspectives on computers and composition instruction* (pp. 44–69). New York: Teachers College Press.
- Irvine, Martin. (1997). *Web works*. New York: Norton.
- Kerlinger, Fred N. (1986). *Foundations of behavioral research* (3rd ed.). Orlando, FL: Holt, Rinehart, & Winston.
- Kuhlthau, Carol C. (1988, July/September). Longitudinal case studies of the information search process of users in libraries. *Library and Information Science Research*, 10, 257–304.
- Larson, Richard. (1982). The "Research Paper" in the writing course: A non-form of writing. *College English*, 44, 811–816.
- Lindstrom, Joyce A. (1998, July 15). Iowa State University Library. Questions you should ask. Available: <http://www.lib.iastate.edu/library/ps/ssh/questions.html> [Accessed: October 12, 1998].
- Lunsford, Andrea. (1996). Intellectual property in an age of information: What is at stake for

- composition studies? In Lynn Z. Bloom, Donald A. Daiker, & Edward M. White (Eds.), *Composition in the twenty-first century: Crisis and change* (pp. 261–272). Carbondale and Edwardsville, IL: Southern Illinois University Press.
- Mellon, Constance A. (1986, March). Library anxiety: A grounded theory and its development. *College and Research Libraries*, 47, 160–165.
- North, Stephen. (1980). Teaching research writing: Five criteria. *Freshman English News*, 9(2), 17–19.
- Reddick, Randy, & King, Elliot. (1996). *The online student: Making the grade on the Internet*. Fort Worth: Harcourt Brace.
- Rose, Shirley K. (1996, August). What's love got to do with it? Scholarly citation practices as courtship rituals. *Language and Learning Across the Disciplines*, 3, 34–48.
- Scholz, Ann. (1996). The libraries of Purdue University: Evaluating World Wide Web information. Available: <http://thorplus.lib.purdue.edu/research/classes/gsl75/3gsl75.evaluation> [Accessed: August 12, 1998].
- Selfe, Cynthia L. (1989). Redefining literacy: The multilayered grammars of computers. In Gail E. Hawisher & Cynthia L. Selfe (Eds.), *Critical perspectives on computers and composition instruction* (pp. 3–15). New York: Teachers College Press.
- Selfe, Cynthia L., & Selfe, Richard J., Jr. (1994). The politics of the interface: Power and its exercise in the electronic contact zones. *College Composition and Communication*, 45, 480–504.
- Smith, Alastair G. (1998). Testing the surf: Criteria for evaluating Internet information resources. *The Public-Access Computer Systems Review*, 8(3). Available: <http://info.lib.uh.edu/pr/v8/n3/smit8n3.html> [Accessed: October 12, 1998].
- Sommers, Nancy, & Simon, Linda. (1993). *The HarperCollins guide to writing*. New York: HarperCollins.
- Spellmeyer, Kurt. (1989). A common ground: The essay in the academy. *College English*, 51, 262–276.
- Spellmeyer, Kurt. (1993). *Common ground: Dialogue, understanding, and the teaching of composition*. Englewood Cliffs, NJ: Prentice-Hall.
- Stoan, Stephen K. (1994, March). Research and library skills: An analysis and interpretation. *College and Research Libraries*, 45, 99–109.
- Sutton, Brian. (1997). Writing in the disciplines, first-year composition, and the research paper. *Language and Learning Across the Disciplines*, 2(1), 46–57.
- Valentine, Barbara. (1993). Undergraduate research behavior: Using focus groups to generate theory. *Journal of Academic Librarianship*, 19(5), 300–304.
- Woolever, Kristin, R. (1991). *About writing: A rhetoric for advanced writers*. Belmont, CA: Wadsworth.