CHAPTER 10

WRITING INFORMATION LITERACY IN FIRST-YEAR COMPOSITION: A COLLABORATION AMONG FACULTY AND LIBRARIANS

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As other authors in this collection observe, when librarians and writing faculty teach students how to plan, conduct, and incorporate research as they write, they often do so with different working definitions of research and information literacy (IL) (e.g., Kissel et al., Chapter 20, this collection, and Norgaard & Sinkinson, Chapter 1, this collection). When Rolf Norgaard (2003) coined "writing information literacy," he argued for how our fields might contribute to one another intellectually and conceptually. Norgaard encourages Writing Studies faculty and librarians to reconsider certain conceptions of students' research, specifically as it interfaces with students' writing practices. We call this interface between writing and research "writing-research," to distinguish students' everyday practices as writing-researchers from the theoretical ideal of writing information literacy (WIL) that Norgaard articulates.[1]

All too often, whether in their own instruction or in their assignment of instruction to others, writing faculty and librarians understand writing-research as a set of skills or a product, a "generic window" on IL (Lupton & Bruce, 2010). Instead, according to Norgaard, they should consider the "intellectual and composition processes that precede and underlie that [final written] product" (p. 127) as well as appreciate students' "fairly complex (if not always effective, appropriate or productive)" practices (pp. 126–127). Our conceptions of research—and those of our students—would benefit, Norgaard insists, from the ways we understand writing—"as a recursive, goal-oriented, and problem-solving activity that involves a complex repertoire of strategies" (p. 127). The recently adopted *Framework for Information Literacy for Higher Education* (ACRL,

2015) (*Framework for IL*) reflects this concept of research. By focusing on core concepts, rather than a set of skills or standards, the *Framework for IL* represents IL as having to do with more complex intellectual practices. In light of these perspectives, it would enhance our collaborations as writing faculty and librarians instructing students on research practice to conceptualize research as we do writing, as a process that itself can be integrated with writing as a writing-research process.

Conceiving of and studying research as process is hardly a new idea to Library and Information Science, though researchers have not consistently attended to the roles of writing in research processes. Since the 1980s, Carol Kuhlthau (1988) has investigated the research processes of researchers of various ages in diverse settings, including college undergraduates. Her Information Search Process, developed out of her empirical work, has had significant influence, sensitive as it is to patterns among writer-researchers' cognitive activities and affective orientations. Yet Kuhlthau's process model privileges information seeking over meaning construction (Lupton, 2004, p. 24), and writing is largely absent as a concern. More recent studies conducted abroad, adopting a process framework (Hongisto & Sormunen, 2010) (Finland) or discovering among students a process orientation to research (Diehm & Lupton, 2012) (Australia), only tangentially address the role of writing, as an "end product" (Hongisto & Sormunen, 2010, p. 107), or as one of the "[p] rocesses for using information" (Diehm & Lupton, 2012, p. 8).

In a small-scale follow-up to Kuhlthau's work, Barbara Fister (1992) used a think-aloud protocol to interview 14 undergraduates, from freshman to seniors, who had successfully completed academic research projects, inquiring about their research and writing processes. Among her findings, she discovered, consistent with Kuhlthau, that students spent a good deal of time and energy in developing a focus for their projects. She also discovered, however, that students readily integrated research and writing, not reserving it for the final stage (as in Kuhlthau's model): "Few of the students saw any clear distinction between research and writing; they saw them as aspects of a single activity, concurrent and integrated" (p. 167). In addition to considering the implications of her findings for research and writing instruction, Fister called for additional research on research processes, especially those employed by average college students.

Recent, broad-scale U.S.-based empirical studies by Project Information Literacy (PIL) researchers suggest the importance of helping undergraduates, including freshmen, develop research strategies and processes as well as the challenges of doing so, particularly as integrated with their writing. In a survey of over 8,000 undergraduates at 25 U.S. campuses, they discovered that about half these students self-reported using processes (what researchers called "routines") for students' writing-research (Head & Eisenberg, 2010). Of those students

employing processes, it was found that "[s]tudents had fewer techniques for conducting research and finding information than for writing papers" (p. 19). Also, students' processes were often more oriented to efficiency than inquiry and learning, or WIL. In a study based on interviews with nearly 2,000 college freshmen about experiences with research in their first semester, Alison Head (2013) reports that some students found themselves taking their "high school research kit"—their set of competencies and strategies—and "retooling it" to deal with the demands of college research (p.14), though not without difficulties. All too often, students' research strategies and processes are formulaic rather than responsive to situational specifics, generative of thinking and learning, and adaptable across assignments. These findings are consistent with Norgaard's call for greater collaboration in conceptualizing (and ultimately teaching) research better informed by our conceptualizations of writing, including complex and elaborated approaches to process. While acknowledging the contributions that have been made, Norgaard notes in a conversation with Catherine Sinkinson included in this volume that "we have a ways to go to foster the disciplinary dialogue and disciplinary cross-fertilization" anticipated by his earlier work (Chapter 1, this collection).

Norgaard's (2003) contribution is significant and still timely, yet its promise for actual collaborations depends on better understanding students' writing-research processes—what they are and in what respects they are most productive (most reflective, that is, of WIL) and most problematic. At this point, however, little is known empirically, especially about the processes of writer-researchers in first-year composition (FYC). Mark Emmons and Wanda Martin (2002) assessed outcomes in a FYC program employing process-oriented, inquiry-based research instruction, yet their assessment did not specifically examine students' writing-research processes. Other studies of undergraduate writing-research have examined students' activities and processes but have not focused on first-year students or students enrolled in a composition course (see, e.g., Beyer, Gillmore & Fisher, 2007; Nelson, 1993; Burton & Chadwick, 2000). Recent empirical work highlighting connections between undergraduates' research and writing has focused not on processes but on "categories" of students' orientation to research and writing (Lupton, 2004) and the extent and nature of students' reading as an attribute of their written texts (Jamieson & Howard, 2013). The need thus persists to better understand the processes of students as writer-researchers in FYC.

This chapter, itself the enactment of a research and pedagogical collaboration among faculty and librarians involved with FYC, considers how FYC students at a private comprehensive university perceive their writing-research as well as to what extent and how those perceptions change over a one-semester composition course. Specifically, we examine the "activities" that students articulate as making up their

writing-research processes—what those activities are for students as a whole; what activities students discuss most and least frequently; and how students' emphases on those activities change over a semester. We also investigate what writing faculty and librarians value as WIL within those activities. The results of this study indicate that students arrive at the university with a sense of writing-research as a process. Yet generally students do not initially articulate activities critical to college-level work: working with sources in ways that might conceptually enhance their development of focus and perspective in response to an assignment. After a semester of FYC, the same students demonstrate significant gains in *how often* they discuss reading and otherwise engaging sources. They also show progress as far as *how* they discuss this and certain other activities associated with purposeful writing-research. Despite these gains, the findings demonstrate little improvement in the spectrum of other writing-research activities or WIL more generally.

In sharing our methodology and results, we hope to better understand students' writing-research processes and to operationalize what WIL means for students, writing faculty, and librarians, thereby enhancing the conceptual grounds for our own and others' pedagogical collaborations.

METHOD

This chapter reports on a one-semester mixed-methods inquiry into how FYC students at a private comprehensive university perceive research, specifically as it interfaces with their writing practices, and whether and how those perceptions change over a one-semester composition course. The study posed three initial questions:

1. What writing-research activities do students articulate in response to a research essay prompt?
2. To what extent and how do students' articulated writing-research activities reflect what Norgaard (2003) terms "writing information literacy"?
3. To what extent and how do students' articulated writing-research activities change over the course of a semester?

The study received approval from the university's Institutional Review Board (IRB) and was begun in August of 2012.

RESEARCH DESIGN

Participants

The study was conducted at a private comprehensive university located in central North Carolina. The university offers a broad range of undergraduate degrees,

including those in the traditional liberal arts, business, furniture and interior design, exercise science, and education. For the academic year 2012–2013, the university enrolled 3,926 undergraduate students, 1,257 of whom were first-year students.[2]

At the beginning of the fall 2012 semester, 562 students were enrolled across 25 sections of FYC,[3] and 408 of these students consented to participate in the study. Per university IRB policies, students who were not 18 years of age at the beginning of the semester were unable to participate. Informed written consent was obtained by individual instructors during the first class session. Students who elected to participate were asked how they wanted their work cited in the study: anonymously, with pseudonyms, or with their real names. A program administrative assistant not involved with the research project created a "master spreadsheet" and assigned every consenting participant a random five-digit numerical code so that none of the participants' identities would be known to the researchers.

Online IL Modules

Before the beginning of the fall 2012 semester, the librarians created a series of five online modules in Blackboard, which were piloted in 13 of the fall composition courses. The modules addressed many of the IL concepts prioritized in FYC, such as database searches using selective keywords, identifying popular versus scholarly sources, citation, etc., and enabled the librarians to cover more content than is possible in one-shot sessions.[4]

Writing Prompt

All students enrolled in the course responded to the following process narrative prompt during the first and last weeks of the semester:

> Imagine that you have been assigned a 1500-word essay for this course. The essay must develop an argument about a current social issue and must use at least three outside sources. Explain how you would go about completing this assignment. Be as specific and detailed as possible.

Students were given 20 minutes of in-class time to respond to the prompt on a computer. They were made aware that the process narratives would not be assigned a grade. Identical prompts were used at the beginning and end of the semester.

Sampling Procedures

The process narrative prompts were administered by course instructors and collected into assignment folders in Blackboard. Instructors then sent these

files to the administrative assistant responsible for the master sheet of students' identifying codes. A computer program was used to generate a simple random sample of 60 participants: 30 from the experimental sections (those who used the online modules) and 30 from control sections. All identifying information from the process narratives was removed, and they were labeled only with the students' numbers. The master spreadsheet also indicated which students were enrolled in the experimental sections. The list of 60 participants yielded 50 pre-tests and 51 post-tests (not matched in all cases), which were made available to researchers using Dropbox file-sharing software. Researchers did not know which students comprised the experimental or control groups until all coding was finished.

Coding Method

The random sample of process narratives was coded collaboratively by the six researchers: four tenure-track Writing Studies faculty and two librarians. To generate initial codes, the researchers first divided into two groups of three—one group focused on the pre-tests and the other on the post-tests. Each team included two Writing Studies faculty members and one librarian. Each team member was assigned 17 pre-test or post-test samples to ensure that all narratives were evaluated in this initial process.

After reading through the data individually doing what Johnny Saldaña (2009) describes as "initial coding" (p. 81)—making notes about patterns and themes that might offer "analytic leads for further exploration" (p. 81)—each research team met independently to discuss their results. Based on the initial coding of the samples, they collaboratively generated a list of potential codes to be presented to the larger group. All six researchers then met to develop a common list of codes (see Appendix for Code Log). Using Christopher Hahn's (2008) suggestions for organizing qualitative coding, the group identified these codes as "level 1" activities. These activity-oriented codes—a kind of coding Saldaña terms "process coding" (p. 77)—describe research-related actions that students articulate in their process narratives. Research-related actions were defined as any step in the research process, from brainstorming to citing. Writing process activities were not coded unless the activity indicated an act of writing-research. Following Saldaña's model, activities were double-coded as different level 1 codes where appropriate.

Recognizing that the level 1 codes would not alone elucidate evidence of students' WIL, and that there needed to be some way of conceptualizing the intellectual work within the students' narratives, the researchers adapted Hahn's (2008) notion of "level 2" coding (p. 6). In our study, level 2 codes relate to

what Saldaña (2009) calls "elaborative coding"—"the process of analyzing textual data in order to develop theory further" (p. 168). Researchers elaborated Norgaard's (2003) notion of WIL by teasing out two concepts central to his theory: invention and inquiry. Norgaard presents these concepts as sites where Writing Studies and IL can productively overlap (p. 128–9), and researchers created level 2 codes for these terms (see Appendix). Researchers therefore agreed to double-code any level 1 activity read as "invent" or "inquire" as a level 2 code. Level 2 codes were applied where students elaborated writing-research processes meant to discover and create new ideas (invent) or to investigate and mediate ideas (inquire). For researchers, these sites demonstrated a more conceptual understanding of the activities associated with WIL; students coded for level 2 had moments when their articulated processes demonstrated an overlap between Writing Studies and IL.

After the final code log was complete, the researchers divided into three pairs, pairing faculty with librarians to the extent possible. Each pair coded pre- and post-tests for 17 students. Coding involved assigning a level 1 code, capturing all raw text data indicating the code onto the spreadsheet, and double-coding for level 2 "invent" or "inquiry" where appropriate. The paired coding process was designed to ensure that the entire data set was coded by at least two readers. When a pair of readers could not reach agreement on a code, they presented the texts in question to the entire group and a consensus was reached.[5]

RESULTS

STUDENTS' WRITING-RESEARCH ACTIVITIES AND WIL

In their narratives, students discussed 15 distinct writing-research activities, as summarized in Table 10.1. Individual students typically articulated a number of writing-research activities in their narratives, averaging 5.19 level one codes on their pre-tests. Pre-test results indicated that students frequently discussed the following activities, typically associated with the beginning of the research process: *brainstorming* prior knowledge and beliefs and finding a *topic*. With respect to finding and preliminarily working with sources, students frequently discussed determining what sources were *available*, *gathering* sources, and designating source *quality* (e.g., by naming resources considered "safe," such as databases). Frequent later-stage activities included *organizing* sources (e.g., as part of an outline) and *integrating* sources textually (e.g., introducing, quoting/paraphrasing/summarizing, or citing). As indicated in Table 10.1, each of these activities accounted for 8–10% of all codes on the pre-tests.

Table 10.1. Counts of coded activities (and as percentage of all codes)

Code	N Pre	% Pre	N Post	% Post	% Change
assignment	6	2.33%	3	1.02%	-1.31%
topic	26	10.08%	31	10.51%	0.43%
brainstorm	22	8.53%	22	7.46%	-1.07%
gather	22	8.53%	20	6.78%	-1.75%
engage	13	5.04%	37	12.54%	7.50%
learn	17	6.59%	15	5.08%	-1.51%
available	23	8.91%	21	7.12%	-1.79%
position	7	2.71%	10	3.39%	0.68%
support	14	5.43%	16	5.42%	-0.01%
different	17	6.59%	17	5.76%	-0.83%
quality	22	8.53%	22	7.46%	-1.07%
relevance	6	2.33%	10	3.39%	1.06%
organize	21	8.14%	16	5.42%	-2.72%
use	18	6.98%	22	7.46%	0.48%
integrate	24	9.30%	33	11.19%	1.89%
TOTALS	258		295		

Writing-research activities associated with working with sources in concert with students' own developing views were discussed less frequently in pre-tests. These less-discussed activities included *learning* more about a chosen topic, *engaging* sources (e.g., reading, notetaking, analyzing), locating *support* for claims, acknowledging *different* views or opinions, and *using* sources (e.g., as "facts," "information," or for other more rhetorical purposes). Discussed even less were the following: understanding the *assignment* and its tasks, determining the *relevance* of sources (e.g., to their topic or other purposes), and taking a *position*. Taken together, these activities form a snapshot of what our students emphasize in the research process as they begin their first semester in college.

Students' writing-research activities at the beginning of the term reflected WIL to different extents, as reflected in Tables 10.2 and 10.3.[6] By far, the activity most commonly identified in pre-tests with WIL was *brainstorming*, because of its association with discovery and problem-formulation—i.e., *invention*. Three other activities were often associated with WIL in pre-tests—not just with *invention* but with *inquiry* (i.e., making and mediating meaning): determining what sources were *available*, *learning* more about a chosen topic, and acknowledging *different* views.

Table 10.2. Counts of activities coded WIL (and as percentage of all codes)

Code	N Pre	% Pre	N Post	% Post	% Change
assignment	1	2.04%	0	0.00%	-2.04%
topic	3	6.12%	7	10.77%	4.65%
brainstorm	13	26.53%	15	23.08%	-3.45%
gather	1	2.04%	1	1.54%	-0.50%
engage	2	4.08%	12	18.46%	14.38%
learn	7	14.29%	4	6.15%	-8.13%
available	7	14.29%	2	3.08%	-11.21%
position	1	2.04%	2	3.08%	1.04%
support	1	2.04%	0	0.00%	-2.04%
different	5	10.20%	6	9.23%	-0.97%
quality	2	4.08%	2	3.08%	-1.00%
relevance	1	2.04%	5	7.69%	5.65%
organize	1	2.04%	0	0.00%	-2.04%
use	2	4.08%	7	10.77%	6.69%
integrate	2	4.08%	2	3.08%	-1.00%
TOTALS	49		65		

Table 10.3. Percentage of each activity coded WIL

Code	% (Pre)	% (Post)	% Change
assignment	16.67%	0.00%	-16.67%
topic	11.54%	22.58%	11.04%
brainstorm	59.09%	68.18%	9.09%
gather	4.55%	5.00%	0.45%
engage	15.38%	32.43%	17.05%
learn	41.18%	26.67%	-14.51%
available	30.43%	9.52%	-20.91%
position	14.29%	20.00%	5.71%
support	7.14%	0.00%	-7.14%
different	29.41%	35.29%	5.88%
quality	9.09%	9.09%	0.00%
relevance	16.67%	50.00%	33.33%
organize	4.76%	0.00%	-4.76%
use	11.11%	31.82%	20.71%
integrate	8.33%	6.06%	-2.27%

Students rarely articulated certain other activities in a way that suggested to researchers that they were discovering ideas, problem-solving, or making meaning in their writing-research. These low writing-information-literate activities included *gathering* sources, locating *support* for claims, and *organizing* sources.

HOW STUDENTS DESCRIBE FINDING A TOPIC AND DETERMINING THE RELEVANCE OF SOURCES

We now consider *how* students' articulated writing-research activities reflect WIL, through in-depth qualitative analysis of two writing-research activities: finding a *topic* and determining the *relevance* of sources. We chose to focus on finding a *topic* because, as indicated in Table 10.1, it was the activity that students mentioned most often in their narratives, persisting in rates of frequency from pre- to post-tests. While the activity *integrate* was coded an equal number of times overall, *topic* was double-coded for WIL at a much higher rate than *integrate* (see Tables 10.2 and 10.3). *Topic* was neither especially high nor low overall with respect to WIL, giving researchers the opportunity to richly compare instances of topic selection judged writing information literate with those that were not. Also evident in Table 10.1, *relevance* was a writing-research activity rarely coded in pre- or post-tests. (That students consider relevance all too infrequently is a finding similar to results in other studies in this collection [e.g., Goscik et al., Chapter 8, this collection; Wojahn et al., Chapter 9, this collection]). Yet as indicated in Tables 10.2 and 10.3, by the end of the semester *topic* and *relevance* would make notable gains in their association with WIL, being highly valued by researchers. This made us want to look at what students who discussed these activities were doing.

Finding a Topic

Students considered to be writing information literate in finding a topic discussed their *multiple steps*: investigating, narrowing, and/or choosing. The student below first investigates a topic—thinks about or (in this case) researches possible options—and then narrows the topic, recognizing multiple possible topics and considering how to select:

> First off, I would spend a decent amount of time researching a variety of social issues that have affected not only the United States, but the world as well. I would strongly lean toward choosing an issue that can be relatable to almost everyone, or target a specific group. (A. Jones, pre-test)

Similarly, another student first investigates and then chooses a topic:

> After having the essay assigned, I would immediately start searching through news articles for a social issue that interest [sic] me. Once I come across the story that has two sides, and could be debated, I know my topic. (S. King, post-test)

These students' descriptions are not elaborate. Yet they differ from those of many students who, while noting the need to select a topic, did not explain how they would go about it.

Students also were judged writing information literate based on the *criteria* they articulated for their topic selection, especially when they articulated diverse or unusual criteria. In general, students turned most often to whether a topic was interesting, current, or controversial. Additional criteria, mentioned less frequently, included how much research was available on a topic, the quality of research on a topic, whether a topic was familiar or specific, whether a topic related to the assignment, whether a student felt a topic could be developed adequately for the essay, and whom a topic considered or addressed. These less common criteria were valued as WIL, particularly in combination with other criteria:

> After that I would then go to the library and find a current social issue that I found interesting. After coming up with some different social issues that I found most interesting I would do a little research on all three to see which one had the most information on it. (Anonymous, post-test)

This student uses a common criterion—interest in a topic—and an unusual criterion—amount of research available on the topic (i.e., "the most information"). (Other students addressing the amount of research on a topic discussed easily researched topics, or topics with enough research.)

Finally, some students identified as being writing information literate in their topic selection articulated *multiple kinds of sources*. Many students discussed using sources in their topic selection, with the resource most frequently mentioned being the Internet. Several students clarified what they were seeking online (e.g., news articles, social media, etc.), or combined online resources with other kinds of research resources, such as magazines, t.v., or even family members.[7]

One student text in particular illustrates all three aspects of WIL for topic selection—multiples steps, diverse criteria, and multiple kinds of sources:

> I would first come up with a relevant topic that would be considered a current social issue. To gather possible topics, I would first watch the world news and look for anything of interest. I

would take note of any possible issues for later evaluation. My second source would be the local newspaper. This would give me a more local perspective on how people in my area may be reacting to national events. For the last source I would turn to the internet to find issues and conflicts that may have not been picked up by the mainstream media. This may include browsing a few independent news sites, reading through a related blog, or viewing specific eyewitness accounts on youtube. After compiling a list of possible topics, I would go through and narrow down the choices and find the most interesting, relevant, and controversal [sic] topic. (S. King, pre-test)

Investigating topics, the student turns to different kinds of sources: "the world news," "a local newspaper," and "the internet." (The student even identifies the purposes behind these differing sources—global, local, and non-mainstream coverage.) Narrowing and choosing among topics, the student employs multiple criteria, considering which topic is "the most interesting, relevant, and controversal [sic]."

DETERMINING RELEVANCE

Researchers regularly identified students' discussions of *relevance* as writing information literate, and as highly associated with "persistence." In total, only 16 text segments were coded for *relevance* codes, making it the second least applied code behind *assignment*. Yet six of these were double-coded level 2 code *inquire*, prompting a closer look at the relationship between *relevance* and WIL. In the examples where level 1 *relevance* codes were double coded with level 2 *inquire* codes, students articulated a need to be persistent in their research in order to evaluate the appropriateness of their sources in terms of their argument. Several of the students explain that this later-stage evaluation process often happens during the writing process. Some examples:

Then once I have decided what point of view I intend to write from I will decide which of the sources would be most helpful for me to prove my point in my essay. That way I can keep the stronger sources and remove the weak sources. (A. Fortin, post-test)

I tend to add at least two more when I'm revising my essay, or I replace sources with ones that are more relevant to my paper. (M. Maire, post-test)

These students show a willingness to give up sources already obtained in order to search for information more appropriate for their purposes. Researchers see these students as demonstrating both persistence in the writing-research process and the ability to evaluate sources in light of the rhetorical situation. In this way, students coded for *relevance* and *inquire* seem to be working squarely within Norgaard's (2003) conception of WIL.

CHANGES IN WRITING-RESEARCH ACTIVITIES AND WIL

Students averaged 5.88 codes on the post-test, a statistically significant difference from the beginning of the semester,[8] suggesting that students' end-of-semester writing-research processes were more elaborated as far as number of activities reported. However, this quantification of codes is less telling than the distribution of codes, which can be seen in Table 10.1. In particular, post-test results indicate that *engaging* with sources is where the fall 2012 FYC made the biggest difference in how students experience and understand the writing-research process.[9]

There was some difference (though not statistically significant) in how often students' activities were coded for WIL by the end of the semester.[10] Even so, results indicated notable changes from the beginning to the end of the term in the distribution of certain activities highly associated with WIL. Gains were seen in level 2 coding (*inquire*, in particular) with respect to four activities—finding a topic, engaging sources, determining the relevance of sources, and using sources, indicating changes possibly associated with FYC (see Tables 10.2 and 10.3). Other activities remained frequently coded by researchers at level 2: learning more about a chosen topic, acknowledging different points of view, and brainstorming prior knowledge or beliefs.[11] That these activities persisted as highly writing information literate is no surprise, given their ready association with inquiry and invention. Conversely, determining what is available was no longer highly associated with WIL by the end of the term, possibly suggesting an opportunity for more emphasis on research planning.

Activities infrequently associated with WIL at the beginning of the term remained so by the end of the term, including gathering sources, locating support for claims, and organizing sources (see Tables 10.2 and 10.3). These results are consistent with the ways these activities tended to contribute to student research processes that were routine and inflexible—e.g., finding a certain number of sources in order to populate an outline devised to bolster pre-formulated claims about an issue. An additional activity, however, became unexpectedly associated with low WIL by the end of the semester: understanding the *assignment*. In other words, by the end of the term, students were less frequently

articulating their efforts to understand their writing-research as rhetorically and purposefully located in relationship to an assignment.

ENGAGING SOURCES

Given the gains made over the term by *engage*—both in the frequency and quality of students' articulations—researchers turned their attention to understanding how students conceived of this activity. The code log defines engage in the following way: "reading, making sense of sources, analyzing, notetaking, annotating; specific to source." However, while any of these activities could be coded engage, researchers found these activities were differentially valued as level 2 codes, with notetaking and annotating remaining a level 1 code if not accompanied by reading or making sense of sources (understanding). Upon reviewing how students who only received level 1 codes conceived activities coded engage, researchers found these students tended to emphasize annotating and note-taking:

> I would find about 5 sources about my current issues and actively take notes about each article. (Snake, pre-test)

> After finding the sources I would go through and highlight any good information or find any specific quotes I want to use. (C. Smith, post-test)

Working with texts in these ways—highlighting and taking notes—is a practice associated with active reading. But it is notable that these students highlight specific information or quotes and take notes without explicitly stating that they would take the time to first read or understand their sources. This step of articulating reading or understanding tended to differentiate the *engage* codes double-coded for *inquiry*. Here are some examples of these *engage* codes coded level 2:

> I would make sure that I spend a lot of time researching, and reading the articles carefully and thoroughly and making sure they would fit in well with my essay. (A. Jones, post-test)

> After concluding my research, I would then take the time to sit down and fully read and comprehend the articles. I personally like to have a paper copy of the sources so that I can highlight important information, take notes in the margins, and mark the text, this way I know where to look when I begin the writing process. (A. Nilan, post-test)

These students present making meaning of their sources—reading and comprehending them—as an explicit step in their research processes. The first excerpt from student A. Jones was also double-coded for *relevance*, giving an example of our interpretation of particularly complex activities. The student will "spend a lot of time researching," indicating persistence, then turn to "reading the articles carefully and thoroughly and making sure they would fit in well with my essay," articulating the step of reading, understanding, and determining relevance. Reading and understanding also tended to convert a level 1 *engage* code into a level 2 code: 10 of the 15 level 2 *engage* codes addressed reading or understanding sources, although these codes were concentrated among only seven students.

Among students only assigned level 1 codes, *engage* also tended to be perceived as "grabbing" information:

> The next step I would take is actually finding those three outside sources and grab all of the details and information I can from them. (Anonymous, pre-test)

While the above example was coded *engage*, it is typical of many activities coded *gather*, which offers a counterpoint to engage-as-inquiry. In these activities, students often referred to grabbing information and details to use in their essay

DISCUSSION

Contributions and Future Research

This study makes several contributions to what we know about undergraduates' writing-research activities and processes as well as suggesting areas for further research. We turned to students' own articulations of their writing-research, which helped us to better understand writing-research from their perspective, and we did so on a much larger scale than is typical for such studies (see, e.g., Fister, 1992; Kuhlthau, 1988; Lupton, 2004; Nelson, 1993). Continued research is needed employing methods centered on students' perceptions and activities, ideally with larger sample sizes. The challenge of such research is also grounding it in students' actual writing-research contexts (one limitation of this study, given its hypothetical prompt). Wojahn et al.'s (Chapter 9, this collection) analysis of students' reflective essays and research diaries provides an innovative model of IL research grounded in students' discussions of their research processes related to specific course assignments.

The students in the sample reflected our campus's first-year population as a whole, responding to Fister's (1992) call for study of average undergraduates

as well as exceptional ones. The writing-research activities students articulated were similar to those described by others. For example, our students frequently discussed finding a topic, consistent with Kuhlthau's (1988) "selection" stage and part of what Fister (1992) describes as "formulating a focus for research"—one of the most time- and energy-intensive activities of the research process (p. 164). Our close analysis of this activity contributes to what we know about students' various approaches to topic selection and what it might mean to be writing information literate in this respect. Determining the relevance of sources is also an activity consistent with earlier findings. First-year students consider relevance to be one of the most challenging aspects of research (Head, 2013). Kuhlthau (1988) describes it as part of "exploration," which she considers to be the most difficult stage of research, one during which students often give up (p. 262, 299–300). Interestingly, and responsive to Kuhlthau's observation, we judged students as writing information literate when they articulated persistence in determining relevance.

Unlike earlier studies, ours highlights the importance of students' engagement of sources, thereby contributing to a conversation on how the material practices of students' reading, notetaking, etc., implicate students' meaning making (see also Jamieson & Howard, 2013). It comes as no surprise that first-year students are challenged by reading sources, particularly scholarly sources (Head, 2013). Our findings on *engage* are consistent with the Citation Project, where through content analysis of student writing, researchers are finding that students focus on sentence-level quotations they can use rather than understanding what they read (Howard, et al., 2010; see also Goscik et al., Chapter 8, this collection). The study also traces several activities often deemphasized or found to be problematic by librarians as writing-research, perhaps because of their strong association with writing: organize, use (see, e.g., Hongisto & Sormunen, 2010), and integrate (see, e.g., Head, 2013). Further research might examine more closely how students articulated these and other activities, including what counted as WIL.[12] (One model of such research is provided by Karen Goscik and her colleagues in this collection, in their careful analysis of what it means for first-year international students in a developmental writing class to organize their writing.) This study—focused primarily on students' activities—also leaves open questions about how students group such activities, or order them in their individual writing-research processes. As librarian Catherine Sinkinson (Norgaard and Sinkinson, Chapter 1, this collection) notes the writing-research process is ideally "one in which information seeking, reading, and writing are recursive and intertwined," even though we too often "present a fragmented process to students in which writing and information may appear vastly disconnected."

The study's assumption that writing and research should be thought of and studied as blended activities in processes of writing-research is not shared by some (e.g., Kuhlthau, 1998; Stotksy, 1991). It also was a limitation in speaking to students' use of writing and research techniques, respectively (e.g., Head & Eisenberg, 2010), and to the extent of students' integration or separation of writing and research (see Fister, 1992). Nevertheless, similar to Head and Michael Eisenberg (2010), we generally observed that students' writing-research activities were more efficient than inquiring, far less articulate and elaborate than we had hoped. No doubt our generic prompt is partly to blame. And more research remains to be done analyzing multiple coded text segments for possibly rich instances of WIL, as well as the activities and processes of students who were not coded at all for IL as compared with those who were.

TEACHING AND FACULTY/LIBRARIAN PARTNERSHIPS

The study suggests areas of programmatic strength as well as opportunities for more direct and effective teaching. The pre-tests provide a useful overview of what activities students are focused on when they enter our classrooms, as well as their strengths and challenges in regards to WIL. Students initially appear to be aware of activities related to discovering a topic, finding and considering the quality of sources, and organizing and integrating those sources in their writing. They seem less focused on activities associated with making sense of sources and navigating them conceptually, given the context of an assignment and their own purposes and views. In light of this overview, faculty can create a balance between practices that lets students play to their strengths outside of class (brainstorming, finding sources) and that uses class time to help them build strategies for reading, analyzing, and otherwise engaging sources.

Additionally, the study makes clear what was valued by researchers in regards to students' WIL, suggesting what we might build on as well as change with respect to our teaching. Adopting Norgaard's (2003) WIL as a framework for the study, we were disappointed with the lack of change in students' WIL, results which suggest that the writing program in some ways maintains a view of IL as the "neutral, technological skill" that Norgaard describes (p. 125)—a "look-up skill" (p. 126). Many writing-research activities are "outsourced": left to librarians in their 50–75 minute, one-shot sessions. (The online modules were an attempt to enhance this particular instruction.) While librarians try to deliver a consistent message to all students in FYC, faculty inevitably take a variety of approaches to course assignments, and the sessions often reflect the faculty members' priorities for their assignments. Unfortunately, this is the kind of "'inoculation' approach to IL" Norgaard speaks of earlier in this collection, an

approach that "tends to obscure how IL ought to be seen as a rich, multifaceted literacy that is responsive to changing contexts and opportunities" (Chapter 1, this collection). There may be a mismatch, in other words, between what is valued as WIL and what is taught and how (see Limberg & Sundin, 2006). Such a divide might be addressed programmatically by moving to a more contextual ("situated" (Lupton & Bruce, 2010)) view of writing-research that locates it among wider literacies and learning processes (Limberg & Sundin, 2006; Limberg, Alexandersson & Lantz-Andersson, 2008; Talja & Lloyd, 2010).

It is also likely that faculty and librarians have differing understandings of research and its role within a given student's writing. As just one example, relevance in terms of information might not equate to relevance in terms of rhetorical strategy and vice versa. A more situated approach to IL education and relevance in particular (e.g., Limberg & Sundin, 2006) might better align these two perspectives. The study's code log, created through intense discussion among the faculty and librarians, is an immediately beneficial product of the study that may help bridge terminological divisions between librarians and faculty noted so often in this collection. As a framework for recognizing and understanding the diverse activities within students' writing-research processes, the log provides faculty and librarians with a common language.

The *Framework for IL* provides additional opportunities for future collaborative research. The language of frames and threshold concepts used in the *Framework for IL* has the potential to promote further dialogue between faculty and librarians regarding the practices and "habits of mind" (p. 1) that both groups value in FYC. Several of the frames and their supporting documentation directly address the research and writing skills explored in our study and even use some of the same language. For example, Research as Inquiry (p. 9) mirrors our level two code "inquire." The *Framework for IL*'s emphasis on learning processes, rather than a prescribed set of skills, also allows for more flexibility in developing learning outcomes for FYC. This may enable faculty and librarians to address the disconnect between what is valued and what is taught.

Despite the practical and conceptual challenges, our research can help us and others facilitate students' WIL, by drawing on what students already know and tell us. We know, for example, that topic choice (and, surely, its teaching) involves more complexity than students often recognize—multiple steps, criteria, and kinds of sources. We have learned that relevance is about students' persistence in considering the fit of sources as their projects evolve, supporting their patience as much as their perspicuity. We are now aware that students' engaging of sources is a programmatic strength, one to build on by continuing to move students from information grabbing to purposeful reading and sense making.

Our most important work on behalf of improving students' WIL may be the strengthened collaboration between writing faculty and librarians, facilitated conceptually and pedagogically by the conversations we share—the "institutional 'sweet spot'" (Norgaard & Sinkinson, Chapter 1, this collection) we have created for ourselves. If learning is itself a dialogic act, then it can be strengthened by research activities that prioritize collaboration and promote reflective dialogue.

NOTES

1. This study is the result of a collaboration among librarians and Writing Studies faculty at High Point University. When the learning outcome "integrating sources" received new emphasis in the first-year writing program, the authors wanted to learn more about how student writers perceive research when arriving at college and how that perception might change after taking the required one-semester composition course. Professor Middleton and Professor Scheidt wish to thank the organizers of the Dartmouth Summer Seminar for Composition Research (Summer 2013) as well as High Point University for its support of this research through a course reduction, University Research Advancement Grant, and Summer Scholar Award.

2. The mean combined SAT score for these first-year students was just over 1100. 79% of them came from states other than North Carolina, and 1.3% were international students. 37% graduated from private high schools. 83.1% of students identified as white; 5.1% as African-American or black; and 2.4% as Latin American, South American, or Hispanic. The students were predominantly between the ages of 17 and 19.

3. The writing program also offered a "stretch sequence" of freshman composition offered across two semesters. Students in the stretch courses did not participate in the study.

4. The group had hoped to learn what, if any, effect the modules had on students' processes or information literacy, but the study did not provide a way of identifying or measuring any such effects. From the completion data extracted from Blackboard, researchers found that the modules were not incorporated consistently in all 13 courses. Professors did not always use them in the order suggested or assign them a grade. In addition, many of the concepts addressed in the modules were also covered in one-shot instruction sessions taught by librarians for 21 of the 25 total sections of ENG 1103, including both control and experiment sections. Although there is anecdotal evidence from faculty that they felt the modules were beneficial, the study does not provide enough evidence to claim that the modules did or did not have a significant impact on students' research processes or perceptions of research.

5. That is, "intercoder agreement" (or "interpretive convergence") depended on intensive discussion and, ultimately, consensus as suggested by Saldaña (2008, pp. 27–28) and Smagorinsky (2008, p. 401).

6. We analyzed students' WIL in two respects, both at the beginning and end of the semester: First, we considered the instances of an activity coded for WIL as a percentage of all instances coded for WIL (see Table 10.2). Second, we considered the instances of an activity coded for WIL as a percentage of all instances coded for that activity (see Table 10.3).

7. Students mentioned other research resources far less frequently, including the library, librarians, books, academic databases, and an annotated bibliography provided by an instructor. And many students did not specify what kind of research they conducted in the process of coming up with a topic.

8. The data (x) were transformed as follows: sqrt(x + 0.5). Results of a paired t-test in R on transformed data demonstrate a statistically significant difference (at alpha = .05) in the number of times activities were coded in post-tests ($t(47) = 2.02$, $p = .04896$).

9. Results of a McNemar test in R demonstrate a statistically significant difference in activities coded engage in post-tests ($\chi 2(1) = 11.25$, $p = .0007962$). In order to conduct the analysis, five students' pre- or post-tests were excluded, for lack of a matched post- or pre-test, so that n = 48.

10. The data (y) were transformed as follows: sqrt(y + 0.5). Results of a paired t-test in R on transformed data demonstrate a trending but not statistically significant difference (at alpha = .05) in the number of times activities were coded for WIL in post-tests ($t(47) = 1.75$, $p = .08752$).

11. While brainstorm is the activity most frequently coded for level 2, it was almost always coded for invent.

12. Such research could have significant implications for existing phenomenographic research on students' frames for understanding (or ways of experiencing) the use of sources (e.g., Bruce et al., 2006; Maybee et al., 2013). Two additional codes of particular interest are acknowledging different view or opinions and understanding the assignment and its tasks. Kuhlthau (1988) found navigating contrasting perspectives to be a significant challenge, yet Fister's (1992) exceptional students welcomed such contradictions. Nelson's (1993) case studies point to the provocative hypothesis that students' understanding of their assignments and tasks explain the difference between "valuable opportunities to extend their knowledge through critical inquiry or unchallenging exercises in gathering and reproducing information" (p.116).

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APPENDIX

Code Log
Level 1 Codes

understand *assignment* and its tasks
find *topic* of interest
brainstorm prior knowledge or beliefs
gather sources
process/*engage* sources
learn more about chosen topic
determine what is *available*
take a *position*
locate *support* for claims
acknowledge *different* views or opinions
evaluate source *quality*
determine *relevance* of sources to topic or purpose
organize/arrange/outline
use sources
integrate sources textually

Level 2 Codes

invent
inquire