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Foregrounding the Research Log in Information Literacy Instruction

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Abstract

Updating an earlier study, this article reviews the literature of information literacy (IL)

instruction since 2008 for empirical evidence of the value of research logs or research journals

for effective pedagogy, assessment, and prevention of plagiarism in IL instruction at the college

level. The review reveals a mismatch between the acknowledged theoretical and practical value

of research log assignments and the mixed advocacy for them in the literature. The article further

analyzes the literature for the drawbacks of research log assignments and points toward ways of

mitigating these drawbacks.

Research logs, also called "research journals," "narratives of research," and a wide

variety of other terms, are assigned often—but not often enough—in information literacy

instruction. Research log/research journal assignments ask students to keep track of their

research process and produce an artifact—a log, a journal, a story—describing and reflecting on

that process. I will argue in this paper that the literature of information literacy (IL) instruction

provides ample backing for the idea that the research log/research journal assignment can be a

useful exercise for the development of information literacy at the college level. In my earlier

review of literature published from 2000 to 2008 (Fluk, 2009), the value of such an assignment

for effective delivery of IL instruction as well as for insightful performance-based assessment

became apparent. Ironically, however, the enthusiasm in the literature for the use of research

logs/research journals in IL instruction was not heavily backed by empirical research (p. 49) and was, indeed, belied by underutilization (p. 46). This paper updates the 2009 literature review, looking for scholarly evidence of the value of research logs/research journals for pedagogy, assessment, and—expanding on the earlier review—prevention of plagiarism. Also expanded here is the scope of the literature reviewed to include the major information literacy textbooks and instruction manuals currently in use, searching for their advocacy (or not) of student research logs/research journals.

The research questions are:

1. What empirical evidence is there in the recent literature for the value of research logs/research journals in IL instruction at the college level? *And*

2. How prominently does advocacy of research log/research journal assignments figure in recent IL textbooks, instruction manuals and other works for IL instructors, and scholarly articles on IL instruction? If the advocacy is weak, what drawbacks are discouraging enthusiasm for these valuable tools?

Drawing the implications of the answers to these questions should help answer an important, practical question: Should library faculty and discipline faculty make the considerable effort required to assign and assess research logs/research journals?

Prologue: a surfeit of terminology

The clumsy compound "research logs/research journals" has been overused in the introduction above to highlight a problem of terminology. My 2009 literature review cited more than 30 terms used to describe narratives of research (Fluk, p. 43). That diversity of

nomenclature persists in the literature to date; indeed, a few additional permutations have surfaced: "group process journals" (Toedter & Glew, 2007); "i-Map … short for information handling map" (Walden & Peacock, 2006, cited in Accardi, 2013, p. 85); "information literacy narratives" (Detmering & Johnson, 2012; Mackey, 2013); "metalearning essay" (Harris, 2013); "research process assignments" (Vecchiola, 2011); and "research writer's journal" (Belanger, Bliquez, & Mondal, 2012).

In addition, the forms taken by "research logs/research journals" can run a wide gamut: simple description, such as lists of keywords and tables of results (e.g., Bolner, Poirier, Welsh, & Pace, 2013); responses to guide questions (e.g., Hlavaty & Townsend, 2010; Lacy & Chen, 2013); worksheets (Carter, 2013); double-entry journals or two-column note-taking (e.g., Ballenger, 2015; Evering & Moorman, 2012); and more comprehensive reflective search narratives (e.g., Bonnet et al., 2013; Detmering & Johnson, 2012; Mackey, 2013; Tuttle & McKinzie, 2007). In physical form, research logs can be created as written text, paper or electronic; in blogs (Land & Meyer, 2010, p. 70) and ePortfolios (Jefferson & Long, 2008); as "think-alouds" or oral reflections (Frey, 2011, pp. 51–52); as recorded "audio journals" (Bowler, 2010); and as reflective classroom dialogue (Sinkinson & Lingold, 2010).

The implications of this profusion of variant terminology are not insignificant. Willson (2012) points out that "differences in terminology … make the literature hard to find" (p. 54). To identify scholarship about research logs, it is often necessary to deduce from a text that a "research log" is indeed under discussion: in their handbook for IL instructors, for example, Torras and Sætre (2008) describe an assignment that has multiple elements of a research log (search strategy, justification of the process, and reflection on the results) but they do not explicitly use the term (p. 47). Likewise, Badke's (2014a) description of his graduate

research strategies course eschews the term "research log," but does focus on process and documentation of process. And the worksheets used by Carter (2013) for formative assessment of IL skills are entirely analogous to research logs.

The terminology problem also complicates the scholarly conversation about the utility of the research log assignment. It is clear that "different terminology may imply different instructional purposes and even different pedagogical philosophies" (Fluk, 2009, p. 43). However, the present literature review seeks to establish what, if any, scholarly evidence there is in favor of assigning any type of research log in IL instruction at the college level; whether the level of advocacy of such assignments is high and, if not, why not; and what, if anything, should be done to change the situation. Therefore, at the risk of oversimplification, this paper adopts a broadly inclusive definition of the research log/research journal as *a tool for documenting and reflecting upon the progress of student research*. In reviewing the literature, "research log," "research journal," and cognate terms will be used interchangeably.

Research logs and learning theory

Theoretical backing for the research log assignment is stronger than ever before.

Behaviorism/Cognitivism

Traditional behaviorist/cognitivist learning theories have always provided (and continue to provide) natural support for limited forms of research log assignments: Behaviorism and cognitivism assume that knowledge is of fixed character and is attained by direct instruction, drill and practice (Cook, 2008, p. 6). Applied to information literacy, such theory focuses on concrete content and skills: finding the "correct" information sources by pursuing "correct"

procedures in the "correct" order (Bowles-Terry, Davis, & Holliday, 2010, p. 226). Behaviorism and cognitivism justify the use of unadorned research logs in the form of lists of search terms, tables of keywords linked by Boolean connectors, and questionnaires and graphical worksheets that guide students through linear procedures for finding information. Such assignments correspond to Moon's (2006) "descriptive journaling" which, she argues, relates to "the accumulation model of learning" (p. 19).

Constructivism

However, traditional learning theories have, in recent years, yielded primacy of place to constructivist models; the latter are hospitable to more comprehensive research log assignments in IL instruction than are behaviorism and cognitivism (Moon, 2006, p. 19). Constructivist learning theory is "based on the assumption that all learning is contextual and that knowledge cannot be taught but must be discovered" through "student-centered learning" (Cook, 2008, p. 6). "Context" here includes student experiences, classroom dialogue and other activities, authentic problem-solving, and social frames of reference, all contributing to the "construction" of knowledge by students and teacher working together (Cook, 2008, p. 6). Constructivism develops the student engagement required for "deep" rather than "surface" learning (Badke, 2012, p. 120; Diehm & Lupton, 2012, p. 217; Hepworth & Walton, 2009, p. 45).

It follows, then, that in IL instruction, constructivist theory lends support to the assignment of research journals in which students not only describe their research process, but also analyze it and reflect upon it, creating a map of the "thought-path they traveled" (Gilchrist, 2012, p. 17). Hlavaty and Townsend (2010) assigned "pre-scripted [research] logs" in their first-year English composition class to walk students through their research process and thereby make them think about the process and about the relevance to their research of the sources they

retrieved (pp. 155–156). Research journals of this kind inculcate a process view of information research: "research as a process not a product, as an activity not an item to be found" (McClure, 2011, p. 323). They also counteract the notion of research as a linear process, acknowledging and validating its "messy" and "iterative" nature (Diekema, Holliday, & Leary, 2011; Head & Eisenberg, 2010, pp. 26–27; Markless, 2009, p. 34; Ortlipp, 2008, p. 704; Sinkinson & Lingold, 2010, p. 82).

The reflection that informs constructivist research journals can be defined as "the ability to think in order to learn something new" (Lähteenmäki & Uhlin, 2011, p. 144) and, more pithily, as the answers to "(1) What? (2) So what? and (3) Now what?" (Jefferson & Long, 2008, p. 140). Answering these questions effectively in the form of a research journal helps students to focus on and organize their search and research process and make sense of the information obtained (Detmering & Johnson, 2012, p. 7; Jefferson & Long, 2008, p. 140; Markless, 2009, p. 33); to become aware of information literacy concepts and issues (Bent & Stockdale, 2009); and to develop into lifelong learners (Kaplowitz, 2012, p. 31). Reflective research journals promote all of the skills in Bloom's taxonomy of learning objectives including the higher-order skills of analysis, synthesis, and evaluation which are not necessarily addressed by research logs informed by traditional learning theories (Hepworth & Walton, 2009, pp. 58–60). Grassian and Kaplowitz (2009) see the reflective research journal as a tool for acquiring metacognitive skills, the "thinking about thinking" that is necessary "in order to really learn" (p. 36).

Constructivism underpins several pedagogical strategies that make use of research journals and their analogues: active learning (Badke, 2012, pp. 116–118; Bean, 2011;Grassian & Kaplowitz, 2009, pp. 102–103; Hlavaty & Townsend, 2010, pp. 151–152; Oakleaf, 2012); discovery-based learning (Farmer, 2011, p. 111; Torras & Sætre, 2008); inquiry-based learning

(Bean & Iyer, 2009); learner-centered teaching (Grassian & Kaplowitz, 2009; Kaplowitz, 2012); and problem-based learning (Diekema et al., 2011; Dodd, Eskola, & Silén, 2011).

The most influential theorist of information literacy instruction in the last 30 years is Kuhlthau who has written extensively since 1985 about the pedagogical and psychological implications of her constructivist model of the Information Search Process (ISP). (A selected list of Kuhlthau's publications and a summary of her research about the ISP appear on her website at http://comminfo.rutgers.edu/~kuhlthau/.) Her seminal work, *Seeking Meaning* (2004), contains several justifications for research log assignments: tracking and documenting student experience with the ISP and helping students to "see changes in their thinking" over time (p. 135); serving as "a tool for formulating thoughts and developing constructs" (p. 141); "recording interesting ideas, connecting themes, and emerging questions," deterring plagiarism, and facilitating both student self-assessment and instructor assessment of student learning (p. 147).

This review of the literature on the use of research logs in IL instruction yielded multiple citations to Kuhlthau's work, among them Bonnet et al. (2013) writing on the use of undergraduate personal essays; Bowler (2010) on adolescent metacognition; Cahoy and Schroeder (2012) on affective learning in IL instruction; Deitering and Jameson (2008) on "information literacy portfolios;" Detmering and Johnson (2012)on "information literacy narratives;" Hepworth and Walton (2009) on inquiry-based learning; and Torras and Sætre (2008) on IL education. Willson (2012) used research logs analogous to Kuhlthau's to study one-shot IL instruction. Finally, research logs play a major role in the work of a Kuhlthau colleague (Kuhlthau, 2013, p. 96): In her book on *The Elements of Library Research* (2008), written for college students, George advocates the use of research logs from the beginning of the research process and reiterates their importance throughout the book. She gives the same advice to

teaching faculty in her introduction to Deyrup and Bloom's (2013) anthology of strategies for teaching undergraduate research.

Threshold concepts

The threshold concept approach represents a more recent arrival on the scene of information literacy learning theory, but it too supports the use of the research log assignment. First advanced by economists Meyer and Land in 2003 (Flanagan, 2014) and, since then, applied to several other disciplines (Oakleaf, 2014, p. 510), "threshold concepts are the core ideas and processes in any discipline that define the discipline, but that are so ingrained that they often go unspoken or unrecognized by practitioners" (Townsend, Brunetti, & Hofer, 2011, p. 854). This definition begs the question of whether information literacy is, in fact, a free-standing discipline (Fister, 2014); Badke (2012) argues that IL instruction, reconceived as "research processes instruction," should be used to teach students not *about* the disciplines they are studying but *how to do* those disciplines (p. 93) and Farrell (2012, 2013) views "generic" IL instruction as limited to learners who are novice or advanced beginners while higher levels require situated (i.e., discipline-specific) IL instruction. Nevertheless, the notion of threshold concepts has been applied to information literacy instruction (Hofer, Townsend, & Brunetti, 2012; Townsend et al., 2011) and a Delphi study is currently under way to identify the threshold concepts for the field (Brunetti, Hofer, Lu, & Townsend, n.d.).

Although there is as yet no agreed-upon list of threshold concepts for IL (Fister, 2014) and there are some dissenting voices (Delany, 2012; Saracevic, 2014; Wilkinson, 2014, June 19), the Association of College and Research Libraries (ACRL) has adopted threshold concepts theory as the basis for the update of its *Information Literacy Competency Standards for Higher Education* (ACRL, 2000). The third draft of the new *Framework for Information Literacy for*

Higher Education issued by the ACRL Information Literacy Competency Standards Review

Task Force (2014d) omitted all references to potential assignments in favor of a shared online

repository of instructional materials or "sandbox" to be developed (p. 3). The final version of

the *Framework* which was discussed by the ACRL Board and "filed … February 2, 2015 as one

of the constellation of information literacy documents from the association" (ACRL, 2015) does

likewise. But earlier drafts included recommended "self-assessments" and assignments that

would help students grasp each of the threshold concepts in the *Framework* and they featured

research journals and their analogues. See Table 1 for a summary of the inclusion of research

logs in the *Framework* drafts. Given the early stage of research into threshold concepts in IL, it is

not clear that the suggestions of research log assignments arise directly from the theory but,

certainly, the theory is hospitable to them. In addition, notes Oakleaf (2014), the *Framework*'s

"emphasis on concepts rather than skills" favors the use of performance assessments such as

"research logs, reflective writing, 'think alouds,' …" (p. 513). Finally, the notion of learning as a

journey which must cross multiple thresholds on the way to mastery of important concepts

merges nicely with the view of research as a recursive process and the research log or journal as

the story of that process.

Table 1. Representation of research logs/journals in drafts of the *Framework for Information

Literacy for Higher Education* of the ACRL Information Literacy Competency Standards

Review Task Force.

Draft of the *Framework*	Threshold concept	Recommended self-assessments	Suggested assignments
Draft 1, Part 1 (2014a)	Research as inquiry (p. 14)	Research logs	Reflection on steps involved in research; Journaling on the research process

Draft of the *Framework*	Threshold concept	Recommended self-assessments	Suggested assignments
	Format as process (p. 16)	Reflection on methods of finding information	
Draft 1, Part 2 (2014b)	Searching is strategic (p. 5)		I-Search paper; Assignments that serve as parts of or scaffolding for I-Search paper
Draft 2 (2014c)	Research as inquiry (p. 15)	[N/A: self-assessments are omitted from Draft 2]	Reflect on steps in researching a topic; Diagram the steps required; Journal about own research process, and relative to others' research; Research logs
	Format as a process (p. 16)		Reflection
	Searching as exploration (p. 16)		I-Search paper
Draft 3 (2014d)		[N/A: self-assessments are omitted from Draft 3]	[None: assignments are omitted from Draft 3, in favor of an "online repository (sandbox)" to be developed (p. 3)]
Final version, as filed by ACRL (2015a)			[None: assignments are omitted from final version, in favor of the "online repository developed by the ACRL" ((ACRL, 2015b, Appendix 1)]

From theory to practice: the uses of research logs

Thus scaffolded by multiple learning theories, the information literacy instructor can use

research logs for a wide variety of purposes. The literature cites pedagogy (both cognitive and affective), assessment, and the prevention of plagiarism.

Pedagogy: cognitive

The most comprehensive treatment of the cognitive purposes of "learning journals" is in Moon's (2006) eponymous work and in *Journal Keeping* by Stevens and Cooper (2009). Neither of these titles deals directly with information literacy instruction, but much of their analysis is applicable. At the most basic level, research logs "record experience" (Moon, 2006, pp. 44–45; Kuhlthau, 2004, p. 135; Stevens & Cooper, 2009, Chap. 1). They make students conscious of their research process (Bonnet et al., 2013; Corbett, 2010; Detmering & Johnson, 2012; Gilchrist, 2012, p. 17; Hlavaty & Townsend, 2010; Kuhlthau, 2004, p. 147; Mackey, 2013, p. 23). In the words of Emmons (2013), research logs "make students mindful" of their research process (p. 44). Other authors use a variety of metaphors from the material world to describe the effect of research logs: For example, research logs "shape the complex and sometimes chaotic realities of academic research into coherent stories" (Detmering & Johnson, 2012, p. 6); they "[structure] experience so that we can make sense of it" (Detmering & Johnson, 2012, p. 7); they "[map] the information landscape" (Hepworth & Walton, 2009, p. 154); they "concretize the intellectual work of the research process" (Torrell, 2010, p. 95).

Another set of metaphors relates to shedding light on, to making visible: Bonnet et al. (2013) examined students' "personal essays" which "provided insights into the nuts and bolts of students' research processes [and] illuminated their thoughts about the nature of engaging with and creating scholarship" (p. 38). Bowler (2010) wrote that "keeping a search journal helps to make the evolution of thinking explicit" (p. 40). Without using the word "log" or "journal" or any analogous term, Markless (2009) promotes "activities that enable students to make their

current information strategies and skills transparent so that they can be discussed and reflected upon as a basis for development" (p. 37). Writing professor Norgaard (2003, 2004) wrote an influential pair of articles in which he urged collaboration between instructors of IL and composition. In the second of these articles (2004), he advised doing "more to make the research process visible, a subject of explicit and ongoing discussion" (p. 223). Instruction librarians Bowles-Terry et al. (2010) applied Norgaard's theory in their classes using reflection assignments, and Detmering and Johnson (2012) cite Norgaard in their article on "information literacy narratives."

In each case, the larger objective for using research journals is to facilitate learning, content-based or metacognitive. In IL instruction, content-based material includes traditionally taught tool-based search and retrieval skills and information evaluation techniques. In spite of the recent and welcome refocus on concepts over skills, several sources remind us that these skills remain important and should not be scorned (e.g., Bent & Stockdale, 2009, pp. 46–47; Bodemer, 2012). Farrell (2012, 2013), especially, provides a multi-layered perspective that acknowledges the need for contextless skills acquisition in the early stages of learning.

However, under the influence of constructivism, skills do tend to take a back seat to more abstract IL concepts and habits of mind as learning objectives (Diekema et al., 2011; Leebaw, Tompkins, & Jastram, 2011; Markless, 2009, p. 33; Martin, 2013, pp. 122–123). Corbett (2010) used "research process notes" to help students think of research as a "recursive process" (p. 270). Diekema et al. (2011) sought to teach the same lesson—"research as an iterative process"—using a problem-based learning approach in which "research journals and reflection papers" have a prominent role.

Another concept that research journals can help students grasp is the notion of scholarly research as a conversation (ACRL, 2015a; Deitering & Jameson, 2008; Fister, 2011). Assistant Professor of Education Tuttle and Library Director McKinzie (2007), collaborating on the teaching of an education course, wrote that "having the students organize and present their own research narratives gave them a voice in the scholarly conversation" (p. 119). Tuttle and McKinzie were cited in a 2009 article in which librarian H. L. M. Jacobs and English professor D. Jacobs described their own collaborative reflective research assignment (p. 77). In the "information literacy narratives" assigned by Detmering and Johnson (2012), students never explicitly mentioned the notion of research as a conversation but seemed to want to join it without knowing how to do so (p. 13). Detmering and Johnson conclude that part of the librarian's task is to collaborate with writing instructors to bring students into the conversation. For a demurring view on the notion of scholarship as conversation, see Wilkinson's (2014, July 10) response to Draft 2 of the proposed ACRL *Framework for Information Literacy for Higher Education* (2014c, June).

The second type of learning that is fostered by research journals is "learning how to learn" (Gilchrist & Oakleaf, 2012, p. 14). Metacognitive reflection or "thinking about thinking" and the application of resultant insights to learning tasks ("self-regulation") are the processes that lead to learning how to learn (Bowler, 2010, p. 28; Budd, 2009, pp. 112–113; Carey, 2012; Hepworth & Walton, 2009, pp. 53–54, 56–57; Mackey & Jacobson, 2014, pp. 9–14). Research journal assignments give students the opportunity to practice metacognitive skills (Kaplowitz, 2012, p. 32; Moon, 2006, pp. 31–33;Torras & Sætre, 2008, p. 48).

Pedagogy: affective

Research logs can also be used to meet the emotional needs of students and thereby improve learning (Moon, 2006, pp. 27–29). Kuhlthau's research (2004) into the Information Search Process did much to highlight the importance of affective considerations in IL instruction, as she was the first to trace the feelings of the student researcher through each stage of the process. In 2010, Schroeder and Cahoy argued that the 2000 ACRL *Information Literacy Standards for Higher Education* should incorporate a sixth standard regarding affective learning with appropriate performance indicators and, as one assessment tool, they recommended research logs "to reveal students' feelings, frustrations, and confidence levels" (p. 141). In 2012, the same authors advocated "embedding affective learning outcomes in library instruction" and cited a research journal assignment that focused on student attitudes and frustrations (Cahoy & Schroeder, p. 81). In 2013, Kuhlthau cited Cahoy and Schroeder (2012) in her own argument for "rethinking the 2000 ACRL *Standards*" (p. 95). ACRL has, of course, gone far beyond tweaking the 2000 *Standards* in its new *Framework for Information Literacy for Higher Education*: the description of each threshold concept in the *Framework* is augmented by a list of "dispositions, which describe ways in which to address the affective, attitudinal, or valuing dimension of learning" (2015a).

Detmering and Johnson (2012), citing Kuhlthau (2004) among other writers, assigned their students "information literacy narratives [ILNs]." These narratives have multiple uses, among them to describe the challenges, confusion, and anxieties the students experienced (p. 6). Identifying these feelings serves to help students better understand the nature of their research task (p. 19) as well as to help librarians acknowledge and work on the often negative feelings of their students toward research (p. 12). In her doctoral dissertation (2013), Mackey cited

Detmering and Johnson (2012) and applied a rubric to ILNs to study how community college students looked for information for their first college composition research paper (p. iv). Like Detmering and Johnson, she saw dual uses for the assignment: to "make students think critically about … the research process [and] to capture how students feel about the research process and the library" (p. 40). Somewhat disappointed in the results, Mackey noted that the students found the assignment difficult and did not give her the detailed results she had hoped to collect (p. 99). She considers an alternative format: screenshots and a list of steps rather than a narrative (p. 99).

Somewhat ironically, research logs can also serve another pedagogical purpose, one that has overlapping cognitive and affective implications: Research logs actually serve to *slow down* the research process. Novice researchers, especially in the age of Google and online databases, "tend to reach closure too quickly" (Bean, 2011, p. 8) and can benefit from an assignment that "slows [them] down and forces them to articulate a process that they usually perform mindlessly" (Kymes, 2005, quoted in Frey, 2011, p. 52). Thus, Bean recommends "an exploratory essay … a first-person narrative account of the student's research process, tracing the evolution of his or her thinking. It requires that students keep their research process open, delay closure, and hence explore their issues in depth" (Bean, 2011, p. 249). Bean and Iyer (2009) assign "A Research Narrative Aimed at Delaying Closure and Promoting Inquiry" (p. 38). Kymes (2005, cited in Frey, 2011) uses "think-alouds," a verbal form of the research log, for this purpose. Each of these techniques is a practical means of fostering "the ability to postpone snap judgments" (Maid & D'Angelo, 2013, p. 303).

Assessment

The use of research log assignments for assessment can be divided into two categories: research logs as a research tool and research logs for performance-based assessment of student

information literacy. In both categories, research logs are needed because research papers—

which are the most frequent product of undergraduate student research—fail to reveal the

student's process, much less his feelings and attitudes toward the process (Bodemer, 2012, p.

340; Broussard, Hickoff-Cresko, & Oberlin, 2014, p. 5; Sellar, McMahon, Ogilvie, & McMillan,

2012, p. 2). George (2013) perceptively compares research log assignments in IL to the

requirement in math and science courses that students show their calculations (p. ix). Rubrics for

assessment of certain IL skills often specify that research logs will be needed in order to apply

the rubric. For example, the Association of American Colleges & Universities (AAC&U, 2013)

Information Literacy Value Rubric states:

> Although a student's final work must stand on its own, evidence of a student's research
>
> and information gathering processes, such as a research journal/diary, could provide
>
> further demonstration of a student's information proficiency and for some criteria on this
>
> rubric would be required.

Similarly, in Keene State College's (n.d.) *Information Literacy Rubric*, Learning

Outcome #2—Develop appropriate methods and effective strategies to search for and access

information—is accompanied by the following note: "This outcome is likely only assessable on

assignments that reflect a student's process, e.g., benchmark essay, reflective process essays, a

research log, database search history, etc."

Research logs as research tool

The literature includes several articles on research log assignments used to examine

student research behavior: Mackey's dissertation (2013), mentioned above, used information

literacy narratives to study the research processes of community college students. Radia and

Stapleton (2008) reviewed "reference evaluation logs" to study the influence on students of

biased websites (p. 12). Bodemer (2012) recommended analysis of research logs to help support

the claim that IL instruction promotes transferable critical thinking skills (p. 345). Other writers

have used similar assignments to provide data for the professional development of instruction

librarians (e.g., Bonnet et al., 2013; Detmering & Johnson, 2012; Purdy, 2013; Stapleton, 2010;

Willson, 2012).

Research logs for performance-based assessment

For a good general overview of performance-based assessment in IL instruction,

see Brasley (2013). Assessment can be used to improve either student learning or instructor

development but, more efficiently, both at the same time (Grassian & Kaplowitz, 2009, Chap.

11). Indeed, Oakleaf (2012) states unequivocally, "If you're not assessing, you're not teaching"

(p. 10). Assignments, she argues, can do "double duty;" a research log, for example, can both

help students learn and help instructors assess that learning (p. 11). Kaplowitz (2012) uses the

same expression—"double duty"—to discuss using instructional activities such as research logs

for assessment of IL instruction (p. 119). Other examples of dual-use assignments include

"research writer's journals," described by Belanger et al. (2012); "learner logs" (Bent &

Stockdale, 2009); brainstorming worksheets (Carter, 2013); "research process notes" (Corbett,

2010); and electronic portfolios (Jefferson & Long, 2008).

Preventing plagiarism

Finally, assigning research logs is one of the best ways to combat plagiarism, whether the

plagiarism is deliberate or, as is often the case, unintentional. Many commentators argue that,

instead of pursuing a traditional "punitive policing" approach, faculty have an obligation to

prevent plagiarism through classroom discussion and appropriate assignments (Accardi, 2013; Evering & Moorman, 2012; Fister, 2013). Assignments that require students to document their process prove that the student's research is original (Hoffer, 2013, p. 50) and, thereby, discourage plagiarism (George, 2013, p. ix). Bean's "exploratory essay" is his "favorite way to promote inquiry and combat plagiarism" (2011, p. 249). Accardi (2013, p. 85) recommends two forms of process writing: the "I-map" developed by Walden and Peacock (2006) and two-column note-taking described by Evering and Moorman (2012). Harris (2013) recommends requiring "a metalearning essay" on the day the instructor collects the research papers. Tuttle and McKinzie (2007) assigned a "record of research" and noted that "although it was not a conscious part of the design, this model also eliminated the possibility of plagiarism" (p. 120).

The value of research log assignments: is the evidence empirical?

The literature cited above gives extensive theoretical and practical support for the use of research log assignments for multiple purposes in IL instruction. But our initial research question remains: Is the evidence the result of objective empirical research?

Only a few of the articles I reviewed in 2009 were "based on broad and rigorous empirical research: They provide valuable literature reviews, experiential or anecdotal evidence, case studies, and analysis of pedagogical theory, but few present the results of research studies" (Fluk, p. 49). Today, the situation is not very much different: More empirical studies have been published in the field of IL instruction since 2008 than were published in the 15 years before 2008. But there have been no objective controlled studies of the efficacy of research logs and journals in IL instruction.

In this literature review, most of the articles that are reports of research rather than conceptual papers represent qualitative research examining small cohorts of students to understand their research processes or to assess the impact of IL interventions. They analyze multiple artifacts of student learning, including research journals. Several examples are cited above in the section on assessment; additional examples include Diekema et al. (2011), assessing problem-based learning in IL instruction; Gilbert, Knutson, and Gilbert (2012), comparing— favorably—the IL skills of political science students who experienced a "semester-long library lab" with the skills of those who did not; and Rempel and Cossarini (2013), who did not find increased IL skills in classes taught using active learning techniques compared with classes taught using traditional lectures (p. 51).

A few articles report on quantitative research: Henderson, Nunez-Rodriguez, and Casari (2011) used pre- and post-surveys to assess the IL skills and attitudes of community college biology students. Lacy and Chen (2013) used demographic surveys and research logs to evaluate the impact of instruction on students' search behavior; they note that "without a control group, it is impossible to say that library instruction was the sole factor accounting for their positive search experiences" (p. 137). Mulherrin and Abdul-Hamid (2009) developed an open-book, nonproctored objective test of IL competency to be used for program level assessment in conjunction with review of other learning activities, including research logs. Finally, Willson (2012) used research logs to study the utility of giving students independent research time in one-shot IL instruction.

None of this research into IL instruction has directly addressed the question of whether research log assignments are as valuable as their many proponents say they are. English professor Stapleton (2010) does claim that "logs are a well-established tool used in education as

effective learning aids," but the literature that he cites gives evidence only of their effectiveness "for generating useful data" to answer other research questions (p. 298). Likewise, English faculty Hlavaty and Townsend (2010) claim that the "literature establishes the effectiveness of using research logs to help students understand the research process" (p. 155), but they cite no supporting studies. Their bibliography contains no empirical studies. It does contain an important 2001 article that focuses on the value of research journals in IL instruction, citing composition literature. That article, by English professor Smith, was noted in my 2009 review, and it has been cited several times in IL literature since (Belanger et al., 2012, p. 5; Broussard et al., 2014, p. 24; Gavin, 2008, pp. 15, 24; Hlavaty & Townsend, 2010; Willson, 2012, p. 56).

There remains, then, a yawning gap in the IL literature: to answer the original research question of this paper, there is still virtually no empirical evidence in IL literature for the value of research logs/research journals in IL instruction at the college level.

Advocacy of research log assignments in the literature

I turn to our second research question: Given the extensive support (empirical or not) for the use of the research log assignment in the recent literature, how prominently do research log assignments figure in recent IL textbooks, instruction manuals for IL instructors, and scholarly articles on IL instruction? A survey of these materials looking for their advocacy of research logs as an assignment in information literacy programs has decidedly mixed results.

Textbooks

Of six IL textbooks, only one, George's (2008) *The Elements of Library Research*, consistently foregrounds the notion of research as process and the importance of the use of research logs throughout that process. Ironically, however, Mayer and Bowles-Terry (2013) who

assigned George's book in their upper-division IL course make no mention of research logs in their article describing the course. By contrast, Badke's (2014b) popular textbook, *Research Strategies: Finding Your Way Through the Information Fog* does not assign complete research logs even though his IL course, "RES 500 Online—Research Strategies," emphasizes process over product and each of its assignments requires documentation of process (2014a). Badke's textbook (2014b) does provide two sample "Case Studies in Research" which model detailed narrative descriptions of research into specific research questions using reference sources, books, journal articles, and Web sources, providing keywords, subject headings, rationales for their choice, numbers of results, and selection of results (evaluation) (pp. 174–183). Recent editions of other IL textbooks (Bobish & Jacobson, 2014; Bolner et al., 2013; List-Handley, Heller-Ross, O'Hara-Gonya, & Armstrong, 2013; Quaratiello, 2011) make minimal or no mention of research logs.

Books on information literacy instruction

   Similarly, the level of advocacy for research log assignments varies greatly in monographs written for librarians about information literacy instruction. In addition to Kuhlthau's work (2004), serious support for research log assignments can be found in another 6 out of 23 such works:

- Grassian and Kaplowitz's *Information Literacy Instruction: Theory and Practice* (2009), praised as "one of the most-used textbooks on teaching information literacy" (Broussard et al., 2014, p. 21);

- Jacobson and Mackey's *Information Literacy Collaborations That Work* (2007), where eight of fourteen articles include a reflective assignment, three of them

substantial: DelliCarpini, Burkholder, and Campbell (pp. 19–40); Tuttle and

McKinzie (pp. 109–122); and Toedter and Glew (pp. 161–176);

- sections of Kaplowitz's *Transforming Information Literacy Instruction Using Learner-

  Centered Teaching* (2012) on reflection (pp. 87–89) and metacognition (pp. 31–32);

- Gilchrist and Oakleaf's *An Essential Partner: The Librarian's Role in Student Learning

  Assessment* (2012, p. 11);

- the culminating exercise in Burkhardt and MacDonald's *Teaching Information Literacy:

  50 Standards-Based Exercises for College Students* (2010) called "The Paper Trail

  Project," an updated version of the same project described in the first edition of *Teaching

  Information Literacy* (Burkhardt, MacDonald, & Rathemacher, 2003) and noted in Fluk

  (2009, pp. 43, 48); in both versions, the authors recommend a "very high weighted grade

  of 25 to 30 percent" for the assignment in a credit course (2003, p. 90; 2010, p. 111); and

- Broussard et al. (2014) who use "research process journals" as a tool for formative

  assessment, providing a description and a sample in an appendix (pp. 157–159).

Another six of the 23 works on IL instruction put less emphasis on research logs but see

them as one tool, among many, of IL pedagogy. These works include:

- *A Guide to Teaching Information Literacy: 101 Practical Tips* (Blanchett, Powis, &

  Webb, 2012) which mentions research logs in three of its "practical tips" (pp. 36–37,

  211–212, 217–218);

- Deyrup and Bloom's *Successful Strategies for Teaching Undergraduate Research* (2013),

  in which four out of eleven articles recommend research logs or similar

  assignments: George in her introduction (p. ix); Hoffer, providing a history professor's

viewpoint (pp. 50–51); Accardi, recommending the i-Map and two-column notetaking (p. 85); and Brasley, using research logs for formative assessment (pp. 89–118);

- Hollister's *Best Practices for Credit-Bearing Information Literacy Courses*(2010), in which two articles out of twenty make use of research log assignments: Wheeler, Vellardita, and Kindschi in a class for engineering students (pp. 109–125), and Meier in teaching graduate students (pp. 136–146); two other articles mention research logs in passing: Roberson and Horton (p. 69), and Mery, Blakiston, Kline, Sult, and Brewer (p. 90);

- *Teaching Literary Research: Challenges in a Changing Environment* (Johnson & Harris, 2009), in which two out of fourteen articles explicitly value research logs: Bean and Iyer (pp. 22–40), and Lebbin and McAndrews (pp. 129–142);

- McClure and Purdy's *The New Digital Scholar: Exploring and Enriching the Research and Writing Practices of NextGen Students* (2013), in which two of sixteen articles view the research log assignment as a way to help students overcome the research paper hurdle: Lee cites Macrorie's "I-Search" paper, originally developed in 1984 and subsequently adopted by other writing instructors (pp. 52–53); and Maid and D'Angelo recommend research logs to teach students to see research as a process (p. 306). In his article in the same book, Purdy makes extensive use of research logs, less as a tool of pedagogy, however, than as a tool of his investigation into students' research behavior (pp. 133–159); and

- Ragains's (2013)*Information Literacy Instruction That Works: A Guide to Teaching by Discipline and Student Population*, where only three out of twenty articles feature research logs: Ragains and Emmons suggest them as a tool of student self-reflection and

self-monitoring (p. 18); Emmons suggests them for their "metacognitive effect" (p. 44);

and Zauha, without using the terminology, recommends similar projects to introduce

English majors to literary research (p. 107).

Six recent works on IL instruction contain minimal reference to research logs as a useful

assignment. Among them are Budd (2009), Crane (2014), Farmer (2011, pp. 11, 125), Flaspohler

(2012, pp. 43–44), and Gavin (2008, pp. 25, 177–178). In *Teaching and Learning in Information*

Retrieval (Efthimiadis, Fernandez-Luna, Huete, & MacFarlane, 2011), two articles out of

fourteen briefly describe assignments that are analogous to research logs but without using the

terminology: Bell (p. 23), and Halttunen (pp. 67–71). Finally, four works on IL instruction make

no direct mention of research logs or their analogues: Cox and Lindsay (2008), Kaplowitz

(2014), McAdoo (2012), and Secker and Coonan (2012). Thus, research log assignments figure

weakly or not at all in 10 of the 23 titles here reviewed.

Scholarly articles

Articles in the literature of information literacy instruction also reflect a mixed range of

advocacy for research logs or their analogues. Fifteen out of 30 articles reviewed can be called

serious advocates, including Bent and Stockdale (2009), Bowler (2010), and Carey

(2012); Carter (2013) who used worksheets on identifying and refining keywords for formative

assessment; Corbett (2010), Detmering and Johnson (2012), and Diekema et al.

(2011); Henderson et al. (2011) who recommend "a final narrative and research log" in a

community college biology class—without, however giving a pedagogical rationale; Lacy and

Chen (2013), in a rare example of research log use in one-shot instruction; Mulherrin and Abdul-

Hamid (2009), Oakleaf (2012), Ovadia (2010), Radia and Stapleton (2008), Sellar et al. (2012), and Stapleton (2010).

Another 5 of the 30 articles mention research logs briefly or in passing: Deitering and Jameson (2008), Diehm and Lupton (2012, p. 223), Leebaw et al. (2011), McClure (2011, p. 324), and Schroeder and Cahoy (2010, p. 141). The remaining 10 articles on IL instruction do not mention research logs at all even though the theoretical or practical thrust of their arguments might warrant such mention: Bowles-Terry et al. (2010), Farrell (2013), Holliday and Rogers (2013), Kelly (2014), Koppelman (2009), Mayer and Bowles-Terry (2013), Mazella and Grob (2011), McBride (2011–2012), Sobel and Wolf (2011), and Stewart-Mailhiot (2014).

Drawbacks of the research log assignment

To ask why the literature reflects such mixed levels of advocacy of research logs as an assignment in information literacy programs is to concede that the research log assignment, in spite of strong theoretical backing and multiple practical uses, has weighty drawbacks.

The main drawback to research log assignments is that they are time-consuming and labor-intensive for both student and instructor. Kaplowitz (2012) does argue that "while incorporating reflection opportunities may, on the surface, seem to take away from instruction time, they actually enhance the experience" (p. 32); but that "surface" impression remains problematic. Moon (2006) notes that time "is a major reason for the abandonment of journal-writing" (p. 92). Stevens and Cooper (2009) ask whether journal writing is worth the class time needed; their answer is that it depends on how the use of research journals meshes with course objectives (pp. 9–10). Certainly, one-shot classes lend themselves with difficulty to research log assignments (Hlavaty & Townsend, 2010, pp. 151, 155; Lacy & Chen, 2013, p. 139; Whitlock &

Nanavati, 2013, p. 43; Willson, 2012, p. 62). And even in a credit course, time is a serious

constraint: In a table giving the benefits and drawbacks of assessment tools for IL

instruction, Whitlock and Nanavati (2013) cite Henderson et al. (2011) on the use of research

logs; drawbacks listed are: "Time-consuming for students to complete" and "Time-consuming to

grade" (p. 43). And, as noted above in discussing affective pedagogy, research logs beneficially

slow down the research process; ironically, the time required renders them discouraging (Moon,

2006, p. 26).

A second drawback to research log assignments at the undergraduate level is simply that

they are difficult to produce and to evaluate (Whitlock & Nanavati, 2013, p. 212). According

to Willson (2012), "recording searches adds another task and could increase the mental effort

required to complete the work … particularly for students who are less familiar with searching

and whose cognitive processing space is being used in doing the actual searches" (pp. 62,

63). Stapleton (2010) calls log-keeping "somewhat burdensome" (p. 298) and "a demanding

activity" (p. 299); "it is very difficult," he notes, "to describe every step and thought" in the

process of researching and writing (p. 305). Having rarely been challenged to think about their

processes of information seeking and using, students often find it hard to reflect on them (Bent &

Stockdale, 2009, p. 52). Walden and Peacock (2006) write that implementing their i-Map

required considerable scaffolding on the part of the instructor as "it was not always easy to

persuade students to reflect on learning processes" (p. 212).

A third drawback to research log assignments lies in student frustrations with research in

general. These frustrations have been described by Kuhlthau (2004) and Detmering and Johnson

(2012), among others. Students often consider the requirement to interrupt research with

documentation activities *about* the research to be "busy work" (Corbett, 2010, p. 274; Gilbert et

al., 2012, p. 117) or another "'hoop' to jump through" (Walden & Peacock, 2006, p. 212), and they resist making the effort.

Can the drawbacks of research logs be mitigated?

The literature discusses multiple solutions to the problems identified above, although not much elaboration is provided and the effectiveness of these solutions has not been the subject of empirical research.

Direct solutions to the time problem are suggested in several sources. For example, when Belanger et al. (2012) added a "Research Writer's Journal" to their writing course in order to track student research processes, they eliminated other assessment tools and reduced the number of research papers in the course from two to one. Similarly, Gilbert et al. (2012) added a "semester-long library lab component" and multiple assessments to a course on research methods in political science; acknowledging student time limitations, they combined two or three smaller assignments into a larger one (p. 117). Carter (2013) adapted log-type worksheets already in place in her teaching of course-integrated IL instruction sessions; as a result, her team was able to assess student learning without adding to class time or student workload. Two texts on journal writing in general each include a section on how the instructor should handle the volume of student journals (Moon, 2006, p. 114; Stevens & Cooper, 2009, pp. 123–124); one suggestion common to both is that instructors ask students to highlight sections of their journals for the instructor to focus on. George, writing specifically about logs used to teach library research, makes a similar suggestion:

> that the logs be submitted in searchable form and that students be asked to place in
>
> boldfaced type what they consider to be the major steps they took and tools they used, so

that whoever reviews their process can quickly scan each log for significant points, or

lack thereof, using a grading rubric students know in advance. (2013, p. ix)

An important solution to the time-consuming nature of the research log assignment is to

recognize that one-shot IL instruction lends itself poorly to such assignments. Various alternative

models of IL instruction appear in the literature reviewed here: multiple sessions of course-

integrated instruction (Belanger et al., 2012; Carter, 2013; Gilbert et al., 2012; Hlavaty &

Townsend, 2010); credit courses in IL (Wheeler, Vellardita, & Kindschi, 2010; Whitlock &

Nanavati, 2013, p. 43); and instruction integrated across the curriculum (Bent & Stockdale,

2009; Manuel, 2009, p. 104). In each case, the more substantial time allotted to IL instruction

offsets the admittedly time-consuming nature of the research log assignment.

Such extension of the role of IL instruction cannot happen, however, without serious

collaboration between library faculty and discipline faculty (Diehm & Lupton, 2012, p. 223;

Dodd et al., 2011, p. 133; Flaspohler, 2012; Gilchrist & Oakleaf, 2012). The literature about

research logs in IL instruction discusses collaboration in a surprising range of disciplines:

composition, of course, is the field most heavily represented: Belanger et al. (2012), Brady,

Singh-Corcoran, Dadisman, and Diamond (2009), Corbett (2010), DelliCarpini, Burkholder, and

Campbell (2007), Hlavaty and Townsend (2010, pp. 150–151), Jacobs and Jacobs (2009),

and Lebbin and McAndrews (2009). Three of these seven articles appear in composition

journals, two in library journals, and two in edited works on librarianship; eight of the authors

are composition faculty while nine are library faculty. Other fields include architecture

(Vecchiola, 2011); biology (Henderson et al., 2011; Winch & Hunter, 2007); Chicano and Latino

studies (Delgado & Luévano, 2007); education (Tuttle & McKinzie, 2007); environmental

sciences (Bent & Stockdale, 2009); literary research (Bean & Iyer, 2009; Zauha, 2013); political

science (Gilbert et al., 2012; Stevens & Campbell, 2007); and scientific method (Toedter &

Glew, 2007). Again, the articles appear in a mix of sources: in library journals, in disciplinary

journals, and in edited works on librarianship; twelve authors are discipline faculty and ten are

library faculty. Even at—or especially at—the limited one-shot level, "buy-in and commitment"

from discipline faculty are required for successful implementation of research log assignments

(Lacy & Chen, 2013, p. 139).

Several writers also propose solutions to the other problems connected with the

assignment of research logs—their level of difficulty and student resistance. Among these

solutions are early communication of the requirements of the research log assignment (Stevens &

Cooper, 2009, p. 74), instructor explanations of why it is necessary (Hoffer, 2013, p. 50) and

how it will be judged (Tuttle & McKinzie, 2007, p. 122), sample logs (Stapleton, 2010, p. 299),

and consistent scaffolding over time (Walden & Peacock, 2006, p. 212). Corbett (2010) counters

the "busy work" accusation by making immediate use of each assignment in the activities of the

next class (p. 274). To make log-writing easier and faster, Willson (2012) recommends exploring

new methods of tracking search processes, including database search histories and citation

management tools (p. 63). Concrete incentives include extra-credit points for the research log

assignment (Lacy & Chen, 2013, p. 139) or making it a large part of the final grade (Burkhardt &

MacDonald, 2010, p. 111; Walden & Peacock, 2006, p. 212).

Summary and limitations of this literature review

This review of the literature found substantial theoretical support for the use of research

log assignments in all their variety: Behaviorist and cognitivist theories of learning,

constructivism, and threshold concept theory all lend backing to the notion that research

logs/research journals are an effective tool of IL instruction. On the practical side, the literature provides multiple examples of the use of research logs: for pedagogical purposes, both cognitive and affective; for assessment purposes, by both instructors evaluating student performance and researchers probing how students learn; and for the prevention of plagiarism. However, the literature includes no controlled studies of the value of research logs/research journals in IL instruction at the college level and reflects mixed advocacy of the use of research logs in IL classrooms. Research log assignments are, admittedly, time-consuming, labor-intensive, and difficult to produce and evaluate, and it is hard to convince students of the value of putting in the effort to produce a thorough and thoughtful research journal. The literature does include some solutions to these problems; clearly, faculty are grappling with the drawbacks of the research log assignment.

The state of the research log assignment reflected in this review may be skewed by a number of limitations: As noted above in the "Prologue," some relevant material may have been missed because of the multiplicity of terms used for research logs/research journals and the variety of forms which they can manifest. The material actually reviewed comes chiefly from the literature of information literacy instruction, although it does include some articles published in journals of other disciplines. It focuses on college undergraduates, mostly freshmen and sophomores; is largely limited to the American scene; and considers mostly text-based research logs over other formats (e.g., think-alouds, audio journals, etc.). Also, it is possible, even likely, that the use of research logs in classrooms is more widespread than its representation in the literature; that is, more instructors use such assignments than write about their teaching. Anecdotal evidence to that effect exists in a flurry of messages to the ILI-L listserv (<ili-l@ala.org>) in June and July 2013, subject line "Research Diary/Journal Handout." In response

to a query, fourteen librarians responded with variously-named research logs, worksheets, graphic organizers, research journals, etc., and an additional six expressed interest in receiving copies. Only one of those respondents, Grassian, has published on the subject (Grassian & Kaplowitz, 2009). There is no doubt that surveys of practitioners, perhaps nation-wide, could shed light on the actual use of research logs in IL instruction and, concomitantly, on relevant pedagogical techniques, materials, and best practices as well as practical solutions to the drawbacks of such assignments.

Conclusion

In light of this literature review, then, how should we answer the final question posed at the beginning of this article? Should library faculty and discipline faculty make the considerable effort required to assign and assess research logs/research journals? The answer seems to be a resounding "yes," somewhat modulated by the difficulties of making such assignments. I would argue that further research should focus not only on the gaps in the literature with regard to the effectiveness of research log assignments, but also, at the same time, on practical studies of how to implement them.

It is tempting to conclude from this literature review merely that further research is needed to fill the obvious gaps: In addition to the survey of practitioners mentioned above, objective, controlled studies that compare learning outcomes among students who complete research log assignments with those of students who do not would provide empirical backing for the theoretical and practical support already evident in the literature. Other studies could usefully compare the effectiveness of various types of research logs, implemented among students at different levels of expertise and in specific disciplines. I would argue that, given the extent of the

support in the literature for research logs, studies of how to implement such assignments should not wait for definitive empirical confirmation of their utility. Practical experiments with research log assignments can usefully be conducted at the same time, with particular focus on overcoming the obstacles of limited time, high levels of difficulty, and negative student—and instructor— attitudes. Chief solutions seem to lie in for-credit instruction in information literacy and close collaboration between library and discipline faculty.

Acknowledgements

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