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Carol A. Leibiger

University of South Dakota, C.Leibiger@usd.edu

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“Google Reigns Triumphant”?:

Stemming the Tide of Googlitis via Collaborative, Situated Information Literacy Instruction

Carol A. Leibiger

Associate Professor, Information Literacy Coordinator

University Libraries

University of South Dakota

“Google Reigns Triumphant”?:

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“We all know what professors do, what librarians do, and what students do. We also know those traditional activities do not work anymore. To admit that is to enter the exciting world where instructors, students, and librarians work together to create innovations in learning.” Larry Spence, “The Usual Doesn’t Work: Why We Need Problem-Based Learning”

Abstract:

In her case study describing the implementation of active, problem-based learning in a university hospitality management course, Berger (2008, 128) claims that students lack critical thinking skills that enable them to do academic research, and she identifies Google as the “main culprit.” Overreliance on Google, the most widely used search engine in the world (Vine 2004), affects undergraduates so uniformly that it has been given a name, Googlitis (Urban Dictionary 2010). This phenomenon, which seems to have reached epidemic proportions among students, displays the following symptoms: an overreliance on simplistic search techniques using Internet search engines and the extension of these poor searching skills to the use of library resources (Leibiger 2010). The good news: We’ve diagnosed the problem successfully. The bad news: The disease is more pernicious than we thought. Without early and regular intervention, the disease is likely to affect patients’ ability to survive, at least academically and possibly professionally.

While the metaphor of googling as illness might seem to represent librarian hyperbole, reflecting the fear that libraries will become obsolete in the face of growing user reliance on search engines for information finding, the problem is one that confronts all of higher education as it attempts to teach students how to find and use information for academic, professional, and personal needs. Griffiths and Brophy (2005) determined that students gravitate to search engines even when better-quality library resources are available. In their study, the majority (76%) of students used library web sites to connect to search engines for research (45% chose Google, 9% selected Yahoo!, 6% turned to Lycos, and AltaVista, Ask, and BUBL were used by 4% of

students apiece). The only library resource chosen (by 10% of students) was the library catalog.

The OCLC (2006) survey of Internet use by college students reflects these findings; while 85% of college students “completely” agree that library resources like online scholarly journals provide worthwhile information, 90% also admitted that they prefer to use search engines because of convenience and speed. Cmor and Lippold (2001) have observed that students use the Web extensively, that they tend to have an overly positive view of themselves as effective searchers, and that they give the same credence to both high- and low-quality information sources (e.g., scholarly journal articles vs. postings to discussion lists or blogs, respectively). It seems that students have internalized faculty and librarians’ recommendations of library resources over Google; however, other priorities cause them to prefer search engines. The ease and speed of Google searching seems to reward students for following the “principle of least effort” (Jansen, Spink, and Saracevic 2000; Zipf 1949), thus validating poor searching strategies, which students then attempt to apply when they use library resources like scholarly databases. Students don’t perceive the importance of critical thinking skills that are essential given the many hits they receive while doing unsophisticated searching using Google.

This paper will briefly highlight the pros and cons of Google as an information source, pointing out both its appropriate and inappropriate uses. After a short exposition of Google, the discussion will examine aspects of higher education and library instruction that undermine effective research processes. The discussion will then turn to information literacy, followed by a proposal that faculty and librarians collaborate to intervene in the development of Googlitis by creating and facilitating active, situated, problem-based learning assignments that promote effective information-finding and critical-thinking skills in a discipline-specific context.

Googlitis: Just how serious is it?

Google arrived on the scene in 1998, and since then it has become the Internet search

engine of choice, as indicated by the existence of the verb “to google,” to denote searching for information on the Web (Grenzeback 2009). Google has its strengths, which encourage users to view it as the “go-to” resource for all online information-finding. Its focus on “high content, low hassle, and happy users” (Miller 2005, 58) makes it ideal for searching in the following situations:

- when searchers know exactly what they are looking for, when they are reasonably certain that the information is located on the free Web, or when the needed information can be captured with unique names or phrases (Grenzeback 2009; Vine 2004)
- when finding the quick, simple, and most popular answer is good enough for searchers’ purposes (Abram 2006)
- when searchers don’t have access to a research library and can use Google Scholar or Google Books to access information otherwise not available to them (Grenzeback 2009)

None of these contexts are ones in which college and university students are situated. Their academic research assignments should not involve the finding of quick, “good-enough” information. The fact that they have academic libraries at their disposal means that they don’t need access to the Google’s library surrogates like Google Books, which only provides full text of those works in the public domain, i.e., books published before 1930.

When discussing research with students, it’s important to articulate the limitations of Google that can negatively affect their ability to find high-quality information. Google is an effective search tool only in comparison with other search engines. Google appears to provide a wealth of online information (too much if students don’t have the critical thinking skills and subject knowledge to deal with the flood of information they received from a normal search). However, it taps into only 16% of the content of the Web (Bergman 2001; Lawrence and Giles 1999), most of which is the “Surface” Web (called the “Googlesphere” by Google users [Urban

Dictionary 2010]). The “Deep” or “Invisible” Web, consisting of proprietary sites, government and research sites, and databases like library catalogs or subscription databases, is generally not accessible to search engines (Gil 2010). The latter can only crawl through static pages, whereas the Deep Web consists of databases that produce dynamic pages in response to searchers’ queries (Bergman 2001). Deep Web sites are large and information-rich; Bergman (2001) has investigated the Deep Web and determined that it is 500 times larger and contains information that is 300 times better than that found in the Surface Web. Even if Google can access Deep Web sites, it indexes only the first 101 KB of a web site (a miniscule amount of information compared with the 84,000,000 pages of content—750 terabytes of information—located in the sixty largest Deep Web sources like the Library of Congress web site [Grenzeback 2009]). Since the Deep Web is the most rapidly expanding part of the Internet, overreliance on tools like Google leaves searchers increasingly unable to locate high-quality information on the Web.

Another problem relates to Google’s enabling of unsophisticated searching. Since Google searching is limited to keyword searching, its use promotes poor information-finding strategies that are carried over into the use of library resources. Such resources allow more powerful information-finding techniques such as subject searching and thus provide fewer, more targeted, higher quality hits (Grenzeback 2009). (Those search engines like Ask.com that claim to allow “natural language” searching do their users an even greater disservice by promoting the fiction that online search tools can understand long, syntactically complicated strings of user language and produce usable results [Leibiger 2010].)

Finally, as Vine (2004) and Abram (2006) have pointed out, search engines are businesses that serve primarily their advertisers rather than searchers; Google runs daily experiments on its pages (and users) and as a result is able to feed searchers advertisements aligned with their search terms (Grenzeback 2009). The resulting clutter, at best, slows or

impedes searching, and at worst it distracts searchers from the information that they hope to find (Abram 2007). It does, however, create brand recognition and encourages users to remember a site when they need the product it advertises (Vine 2004).

American higher education, teaching, and learning

To counter students' use of Google and the resulting poor search strategies that students internalize, it's necessary to rethink how research is taught in higher education. Because research assignments are part of the instructional landscape, this study describes current American higher-education instruction and how academic librarians teach in support of faculty course assignments. A “new paradigm” (Johnson, Johnson, and Smith 1991, 1:6) of teaching is then described, one that fosters natural learning of discipline-specific knowledge and information finding and use. In the context of library instruction's support of teaching and learning at American colleges and universities, improved learning via library-oriented research assignments is possible *if* higher-education faculty and librarians agree on outcomes and methods and collaborate in providing opportunities (assignments and instruction) for natural learning to their students. The librarian liaison model encourages academic librarians to seek enhanced relationships and opportunities for collaboration with faculty. These provide librarians with greater roles in shaping research assignments and offer students natural-learning opportunities to internalize information literacy (IL) skills in the context of academic disciplines.

The “old paradigm” in American higher education

The standard view of teaching and learning is that they are complementary activities performed by the actors in the higher-education classroom, i.e., the faculty and students, respectively. Faculty teaching is equated with student learning. The preferred vehicle of information transfer is the faculty lecture (Darkenwald and Merriam 1982). The lecture developed during the early days of university teaching, when textbooks were nonexistent or

scarce and expensive, and the faculty functioned as textbooks. With the advent of the research university, teaching was de-emphasized in favor of research, a state of affairs that continues in contemporary higher education (Johnson, Johnson, and Smith 1991). As higher education has become democratized and commoditized, faculty expertise is imparted to increasingly larger audiences of students, and the lecture functions as an efficient, economical way to teach (Allen 1995). The need to make instruction available to increasing numbers of distant students has led to the ubiquity of synchronous and asynchronous lectures via technologies like virtual meeting software, vodcasting, and podcasting. The lecture format seems to propagate itself over time as higher-education faculty, who are usually subject specialists without much pedagogical training and themselves learned via lectures, turn to lectures to educate their own students (Conger 2001).

Educational scholars have pointed out the problems inherent in the lecture approach to teaching, beginning with the assumption that students are *tabula rasa*, onto which faculty inscribe their expertise via the spoken word. This approach privileges the faculty as expert and highest-ranking actors in the classroom hierarchy. It is problematic for students who are not auditory learners, and it favors lower cognitive functions like memorization of facts over higher-order, reflective tasks like synthesis, analysis, and evaluation (Bonwell and Eison 1991). Cheney (2004, 496) points out that “[m]any educators, despite their best intentions, are not teaching students how to think, how to ask questions, or how to use strategies to gather information to answer those questions.”

Oddi’s (1983) meta-analysis of research on lecturing and learning points out that lectures are no more effective in imparting factual information than experiential methods like case studies and discussions. Mann and Robinson (2009) indicate that 59% of students in their study found lectures boring half the time, and 30% found most or all of their course lectures boring. The researchers demonstrate a causal relationship between faculty lecturing and decreased student

motivation, engagement, and satisfaction in learning; decreased attendance, and consequent poorer achievement as reflected in student grade point averages. (Interestingly, students find lectures accompanied by PowerPoint slideshows extremely boring, despite the addition of a visual dimension to the auditory teaching style.) Lecturing thus represents a style of teaching that does not enhance student learning.

Lecturing flies in the face of research on learning. Knowledge is not a commodity owned by a single expert, but rather the product of group-based social processes and therefore maintained by groups rather than individuals (Johnson, Johnson, and Smith 1991). Lecturing encourages students to equate the memorization of facts with learning. The underlying assumption that faculty are powerful experts also disenfranchises students as active participants in learning and promotes hierarchies and competition within courses.

Students are active participants in learning, as they possess pre-existing learning experiences, knowledge, and styles to draw upon. They are better served by teaching methods that avoid top-down, linear presentations of facts and, alternatively, activate their existing knowledge, allow collaboration and co-creation of knowledge, promote scaffolding of students within learning activities, and call for reflection on what has been learned. Lecturing and its neglect of process in favor of facts probably contribute to students' use of Google in doing research, as faculty do not highlight research procedures during lectures, reporting on the results rather than the process of research in their fields. This devalues research in students' eyes and reinforces their desire to achieve results with little effort. This in turn contributes to students' Googlitis, which is certainly at least a partial cause of the declining reference desk traffic in academic libraries. (Gayton [2008] claimed a 32% reduction in reference transactions in academic libraries between 1994 and 2004; since 2004 the National Center for Education Statistics [2007, 2010] records a further decline of 24% in reference transactions).

While the lecture is not the only type of instruction that students experience in higher education, it is certainly the most popular. Other, more active forms of instruction like discussions and labs that serve to integrate students more into the learning process are still faculty-centered and -driven. Assessment in the context of this “chalk and talk pedagogy” (Helle, Tynjälä, and Olkinuora 2006, 294) is fact-based, individualistic, and competitive, and it serves to sort students by grade, assuming that the grade reflects learning and preparedness for a profession or further education (Johnson, Johnson, and Smith 1991).

The “new paradigm”: Social constructivist and sociocultural approaches to teaching and learning

Within higher education’s “old paradigm” instructional context described above, there is a disconnect between the transmission-of-knowledge style of delivery used in most academic courses and the expectation that this type of knowledge transfer enables students to produce academic papers or practical projects within their discipline. Herrington and Oliver refer to this as the “void between theory and practice” (2000, 42). Students are not well served by this form of teaching or the assumption that it leads to the practical application of research skills to disciplinary learning.

The integration of active-learning methods into higher education is the result of a convergence of movements within education. Vos and de Graaf (2004) point to the combined influence of John Dewey’s (1925) philosophy of experiential learning, research in cognitive psychology on the relationship between cognitive development and education (Bruner 1960), and humanistic psychology’s notion of student-centered learning (Rogers 1969) in the realization that learning involves active student participation rather than passive absorption of traditional frontal teaching by faculty.

The 1980s saw a resurgence of interest in effective undergraduate education. Documents

like *Involvement in Learning*, the final report of the National Institute of Education’s Study Group on the Conditions of Excellence in American Higher Education (1984), set forth twenty-seven suggestions to improve the quality of the undergraduate experience and heighten undergraduates’ engagement in their education. Condition 2 suggested that “[f]aculty should make greater use of active modes of teaching and require that students take greater responsibility for their learning” (27). Additionally, a Carnegie Foundation study, *Higher Education and the American Resurgence*, examined the potential role of higher education in supporting the social, economic, and political renewal, and the technological advancement, of the United States (Newman 1985). The American Association for Higher Education (AAHE) hosted several conferences that articulated “Seven Principles for Good Practice in Undergraduate Education” intended to “prepare students to understand and deal intelligently with modern life.” “Good practice in undergraduate education 1) encourages contacts between students and faculty, 2) develops reciprocity and cooperation among students, 3) uses active learning techniques, 4) gives prompt feedback, 5) emphasizes time on task, 6) communicates high expectations, and 7) respects diverse talents and ways of learning” (Chickering & Gamson 1987, ¶4).

Educational achievement and personal development are associated with Principles 2 (collaborative learning) and 3 (active learning). Active learning is “the process of having students engaging in some activity that forces them to reflect upon ideas and upon how they are using those ideas[,]...to regularly assess their own degree of understanding and skill at handling concepts or problems in a particular discipline” (Morris and Arbruster 2003, 5). It develops both knowledge and skills through such activities as problem-solving exercises, informal small-group work, simulations, case studies, and role-playing (Auster and Wylie 2006). Active-learning tasks involve students in higher-level thinking about course content, utilizing cognitive functions such as synthesis, analysis and evaluation, the highest levels of cognitive function and learning in

Bloom’s taxonomy (Pundak et al. 2009). Active-learning techniques also enable student learning via differing learning styles rather than privileging the auditory style necessary to derive benefit from the traditional faculty lecture. Many active-learning techniques involve collaboration between and among students, resulting in cognitive and affective gains, e.g., longer retention of knowledge, greater student attention to problem-solving and learning strategies (metacognition), enhanced ability to think and reason within a discipline, increased accountability for individual learning and group performance, and greater satisfaction with, and higher motivation in, learning (Chickering and Gamson 1987; Cook, Kunkel, and Weaver 1995; Gokhale 1995; Mabry 1995; Oddi 1983; Pundak et al. 2009). Educators have associated active, collaborative learning with civic values like an increased ability to work within groups, and the cooperation and scaffolding that occurs within groups has been associated with higher academic achievement by students, especially weaker ones, across all student demographic groups, including age, class, and ethnic and racial backgrounds (Gokhale 1995; Page and Mukherjee 2000). Faculty who utilize active-learning techniques report greater personal enjoyment in teaching and enhanced professional satisfaction due to the success of their students (Gamson 1994; Pundak et al. 2009; Smith 1977).

How do active, collaborative methods support learning? Social science research has demonstrated the roles of context, shared meanings, and group interaction in learning. Social-constructivist and sociocultural approaches to education recognize that groups collectively construct knowledge and shared meanings, and that individuals, immersed in the group culture, are constantly learning via interactions with a group and its artifacts (Saturday et al. 2003). These interactions lead to the collaborative creation of knowledge; immersion in a culture of this sort gives rise to constant, natural learning of information and skills necessary to participate fully in the culture. Sociocultural educational theorists like Vygotsky have pointed out that embedding the teaching of skills and knowledge in a context in which they are necessary for the successful

completion of a task within a collaborative community of learners makes learning implicit rather than explicit and thus mirrors learning as it naturally occurs outside the classroom (John-Steiner and Mahn 1996; Vygotsky 1978). Vygotsky’s work has enabled the development of modes of active, situated learning (Oliver and Herrington 2001; Vygotsky 1978), including problem-based learning (PBL) and project-oriented learning (POL) and their derivatives.

Problem-based and project-based learning

Herrington and Oliver (2000) have identified nine characteristics of authentic learning:

- authentic contexts that reflect the way that knowledge will be used in real-life
- authentic activities that are complex, ill-defined problems and investigations
- access to expert performances enabling modeling of processes
- multiple roles and perspectives providing alternative pathways to solutions
- collaboration allowing for the social construction of knowledge
- opportunities for reflection involving metacognition
- opportunities for articulation to enable tacit knowledge to be made explicit
- coaching and scaffolding by the instructor at critical times
- authentic assessment that reflects the way knowledge is assessed in real life

Such an approach, which essentially describes PBL and POL, enables learning by individuals within groups as they participate in real-world, collaborative tasks. Learners work at solving problems beyond their individual knowledge and skills levels with assistance (scaffolding) from group members and faculty, including librarians. PBL and POL teach learners how to learn (Spence 2004).

PBL originated in Canada’s McMaster University medical school in the late 1960s. The goal of medical PBL was to equip students with the necessary knowledge base, problem-solving skills, and self-directed learning skills to become competent physicians (Barrows 1996; Caplow

et al. 1997). The PBL process consists of five steps performed by learning groups: 1) encounter with a problem, 2) determining what learning and kinds of resources are necessary to solve the problem, 3) identifying specific resources and how best to utilize them in learning, 4) using the resources and reporting learning to the group, and 5) assessing progress in learning (Plowright and Watkins 2004; Caplow et al. 1997; Norman and Schmidt 1992; Savery and Duffy 1995). By engaging in group research using appropriate disciplinary resources like reference works, scholarly journal articles, and communication with experts, with scaffolding provided by faculty and librarians as “metacognitive coaches” (Gallaher 1997, 335), students are introduced to the community of practice in their fields and develop the “habits of mind” (Gallagher 1997, 347), i.e., the field’s concepts, research, problem-solving, and critical-thinking skills, as well as necessary interpersonal and teamwork skills, in the context of professional work in their discipline (Bernstein, Bercovitz, and Skinner 1995; Cockrell, Caplow, & Donaldson 2000).

Project-based or project-oriented learning (POL), like PBL, begins with a problem, but goes beyond finding a solution; POL expresses learning via a tangible project (Helle, Tynjälä, and Olkinuora 2006). POL is used extensively as part of active-learning curricula in skills-based teaching, for instance, in native-language writing and in foreign-language teaching using Shrum and Glisan’s (2005) integrative model. POL provides students with the opportunity to apply knowledge learned in “multiple forms of representation” (Helle, Tynjälä, and Olkinuora 2006, 293); a project lends itself well to fields of study in which the written word is not the only form of communication or an academic paper is not the only artifact of interest.

More recent elaborations of PBL and POL include group work-based learning and group field-based consulting (Heriot et al. 2007; Rossin and Hyland 2003), which allow students to engage in problem solving and project completion while situated within a client organization aligned with their chosen profession. This real-world learning (Gijsselaers 1996) allows students

to engage in “cognitive apprenticeships” (Collins 2006, 47; Brown, Collins, and Duguid 1989, 37), where they acquire both domain knowledge (factual and procedural knowledge) and tacit knowledge (heuristic strategies, metacognitive strategies, and learning strategies to accomplish discipline-specific tasks, to monitor, assess, and remedy the performance of such tasks, and to learn both domain and tacit knowledge, respectively), necessary to participate in their chosen discipline (Collins 2006). Situating instruction in students’ disciplines enables their membership in a community of practice via “legitimate peripheral participation” (Lave & Wenger 1991). Relegated to the periphery of the organization by their beginner or apprentice status, students seek to acquire knowledge and skills that will move them to the central, enculturated, insider roles (Brown & Duguid 1991; Brown, Collins, & Duguid 1989).

The success of PBL not only in producing academic achievement (PBL-trained students learn facts as well as, and retain facts longer than, traditionally trained students), but in greater problem-solving ability, as well as greater satisfaction and motivation in learning, leads to higher student retention rates (Albanese and Mitchell 1993; Major and Palmer 2001; Norman and Schmidt 1992; Prince et al. 2005; Vernon and Blake 1993). PBL has been so successful in medical study that it has been incorporated into the training of other professions like architecture, business, law, engineering, forestry, human resource management, police science/criminal justice, social work, sociology, education (Camp 1996; Edens 2000; Plowright and Watkins 2004; Reynolds 2006). Librarians reading this article will recognize the overlap between the PBL learning process and the Association of College & Research Libraries’ (ACRL) *Information Literacy Competency Standards for Higher Education* (2000), so it should come as no surprise that students in PBL programs use the library significantly more frequently and use better sources than traditionally educated students (Albanese and Mitchell 1993; Rankin 1992; Saunders, Northup, and Mennin 1985).

Information literacy and American higher education

American higher education has espoused lifelong learning as an educational outcome. This commitment is reflected in the various reports and standards that have been promulgated for higher education since the 1990s. For example, the ability to find and use information is a desirable learning outcome of higher education, according to both the 1991 SCANS 2000 and 2008 LEAP reports (American Association of College & Universities 2008; U.S. Department of Labor 1991). Shapiro and Hughes (1996) have characterized IL as an indispensable set of competencies for informed citizens that enable their participation in a modern information society. Information literacy is explicitly mentioned or implicitly communicated in the standards promulgated by higher education’s accrediting bodies. For example, the North Central Association’s Higher Learning Commission (2010), the accrediting body for higher education in the Midwestern United States, implies IL in both its “Criterion Three: Student Learning and Effective Teaching” and “Criterion Four: Acquisition, Discovery, and Application of Knowledge.” Recognizing that the ability to find and use information efficiently and effectively is a significant component of lifelong learning, the American Association of Colleges & Universities (AAC&U) has endorsed the ACRL’s (2000) *Information Literacy Competency Standards for Higher Education*.

Information Literacy is a set of skills that enables the finding, evaluation, and appropriate use of information (American Library Association, 1989; ACRL, 2010). An essential component of IL is critical-thinking skills that are necessary for “exploring, interpreting, and participating in an increasingly complex globalized society” (Carlacio and Heidig 2009, 3). The ACRL’s (2000) IL Standards describe an information-literate person as someone who is able to:

- determine the extent of information needed
- access the needed information effectively and efficiently

- evaluate information and its sources critically
- incorporate selected information into one’s knowledge base
- use information effectively to accomplish a specific purpose
- understand the economic, legal, and social issues surrounding the use of information, and access and use information ethically and legally

As the introduction to the ACRL IL Standards (2000, ¶2) stipulates, “[Information literacy] is common to all disciplines, to all learning environments, and to all levels of education. It enables learners to master content and extend their investigations, become more self-directed, and assume greater control over their own learning.”

While IL has a recognized place in American higher education, library instruction generally has a reduced presence, limited to support of general-education courses like Freshman English and Freshman Speech. If IL is mandated by administrators or within state university systems—as is the case in the author’s home state of South Dakota—there is little in the way of programmatic IL instruction because participation is voluntary in all courses beyond the designated IL-mandated ones. Even in disciplines or courses that invite participation by academic librarians, such instruction is limited to one-shot bibliographic instruction (BI) sessions that rarely go beyond information-finding in support of a course assignment.

Like higher education faculty, academic librarians rely on the BI lecture’s direct transfer of knowledge from the IL expert to students. In fact, according to a survey by Shirato and Badics (1997), 94% of academic librarians instruct via lecture. The same survey indicated that librarians also consider lecturing one of the least effective ways to teach IL. Hollister and Coe (2003) surveyed instructional librarians in academic libraries about their preferred teaching methods and discovered that while 96% were familiar with active learning techniques, 97% used the lecture-and-demonstration method of teaching IL, and 85% indicated that they did not consider lectures

an obsolete teaching method. Conger (2001) points out two possible sources of librarians' reliance upon the lecture mode of instruction: the lack of pedagogical training of most librarians (few library schools teach instructional design or pedagogy) and the seeming need to cover all or most of information-finding in the typical one-hour, one-shot BI session. Hollister and Coe's respondents agreed that while they were aware of active learning techniques, they used the lecture because of time constraints and because of the need to respond to faculty instructional needs and desires. Additionally, library sessions that occur without an assignment (or before an assignment is given) lack context and immediacy for students (Berger 2008); such sessions can degenerate into lectures due to lack of student involvement.

Gremmels (1996, 89) aptly describes the lecture approach to IL instruction with the metaphor of the dump truck, which librarians “load as full as [they] can, back...up to the classroom, and unload...onto [their] students, burying them in teaching.” With the best of intentions, academic librarians who use this approach are teaching, but are their students learning? As Keyser (2000) points out, the assumption that students passively absorb the abundance of knowledge provided by librarian experts runs counter to modern cognitive models of learning, as the “dump truck” approach overwhelms students with too much material and denies them the opportunity to practice information finding and use (including critical thinking) in the presence of an expert who can scaffold their learning.

The ACRL (2003) has espoused active learning in its *Guidelines for Instruction Programs in Academic Libraries*, and Hinchliffe and Woodard (2001) include short descriptions of active and collaborative learning in their chapter on instruction in Bopp and Smith's influential textbook, *Reference and Information Services*. Some academic librarians have espoused active learning methods (e.g., Allen 1995; Conger 2001; Cook, Kunkel, and Weaver 1995; Dabbour 1997; Dahl 2004; Drueke 1992; Dyckman 1995; Gedeon 1997; Gremmels 1996;

Keyser 2000; Krajewski and Piroli 2002; Mabry 1995; Ragains 1995; Ridgeway 1989a and 1989b; Smith 2004; Warmkessel and Carothers 1993; Williams and Cox 1992). However, their instruction is constrained to one-shot IL instructional sessions in support of faculty-designed assignments, taught by a librarian as an add-on to the respective course. Because of time constraints on library instruction, librarians are limited to teaching information finding, which occurs without a disciplinary context in general-education courses. Since librarians often orient an IL session around faculty teaching and assignments, information finding is perceived by students to be associated with the library rather than with the discipline for which the library instruction occurs. Spence (2004, 491) points out that students do not take library research seriously unless it is part of the “intellectual architecture” of their curriculum. When librarians and course instructors do not cooperate to integrate the activity into the course syllabus or grade, they miss valuable opportunities to collaborate in instilling discipline-specific mental habits into students by means of research assignments. Collaboration should not only be required of students; it should be modeled by those disciplinary experts who teach them.

Students who receive library instruction in general education courses do not experience reinforcement of IL skills in upper-division courses. To empower students as lifelong learners and to qualify them for full membership in their chosen communities of practice, IL needs to become part of their upper-division, discipline-specific education. Grafstein (2002) points out that every discipline has its particular epistemological structure and notions of critical thinking; students need to progress from general IL skills to those necessary to evaluate research critically within specific disciplines. Tuominen, Savolainen, and Talja (2005, 329) point out that IL is situated in disciplinary practice, and that it therefore develops in the context of disciplinary or work-place tasks and activities: “From the perspective of a situated understanding of learning and learning requirements, information skills cannot be taught independently of the knowledge

domains, organizations, and practical tasks in which these skills are used.” For these reasons, IL should be included in disciplinary teaching in higher education. In recognition of this fact, disciplines such as anthropology, sociology, political science, and psychology have developed their own IL standards (ACRL Anthropology and Sociology Section 2008, ACRL Law and Political Science Section 2008; ACRL Psychology Information Literacy Working Group 2010).

Situated library instruction and Problem-Based or Project-Based learning

A small but enthusiastic group of academic librarians have applied PBL and POL to library instruction in an effort to initiate situated learning of IL skills. Dahl (2004) has developed a scenario-based active learning model that supports the acquisition of IL in a one-shot freshman library orientation session. Berger’s (2008) case study of the introduction of situated learning into a hospitality management course demonstrates the impact of situating IL instruction within topics that are relevant to students. Immediacy and situatedness are the characteristics of PBL and POL as they have been applied to the one-shot library session (see, for example, Carder, Willingham, and Bibb 2001; Cheney 2004; Kanter 1998; Kenney 2008; Lindstrom and Shonrock 2006; Macklin 2001; Munro 2006, Ohles 1997; Pelikan 2004; Snavely 2004; Spence 2004).

PBL provides librarians with the opportunity to integrate their instruction seamlessly into a course or disciplinary curriculum (Kenney 2008; Macklin 2001), as students “experience the content, thinking, skills, habits of mind, and concepts of any field of study” (Gallagher 1997, 347). Because PBL presents students with actual problems from their field of study, learning of research skills via PBL is an implicit part of learning the discipline’s practices (Munro 2006). As was noted above, the PBL process reflects the ACRL (2000) *Information Literacy Competency Standards for Higher Education*. PBL results in more and better use of library resources than traditional library instruction (Albanese and Mitchell 1993; Rankin 1992; Saunders, Northup, and Mennin 1985). Librarians can use PBL to initiate the teaching of critical-thinking skills, thus

extending library instruction beyond information finding and use (Macklin, 2001). Student realization of the value of library resources is driven home by personal or group discovery, and the library’s—and the librarian’s—important role in students’ evolving citizenship in their fields is made obvious (Lindstrom and Shonrock 2006). While librarians are a modest group, another important contribution of PBL is the enhancement of librarians’ position within higher education, as they play equal, collaborative, educator roles with faculty in students’ disciplinary and cognitive development (Kanter 1998; Kenney 2008; Lindstrom and Shonrock 2006; Ohles 1997).

Unfortunately, academic librarians are constrained by their work in faculty courses. PBL-type library sessions tend to fall within the same time allotment as one-hour, one-shot IL sessions, so that their effectiveness is limited to what can be accomplished within that short time. Enger and associates (2003) have demonstrated that several, longer PBL sessions are necessary to achieve the type of active learning that characterizes PBL (e.g., two, seventy-five minute sessions produce more learning using the PBL process than a single one-hour session). Pelikan (2004) suggests longer library sessions (from ninety minutes to three hours in length) to accomplish PBL lessons, but such extended sessions are difficult to arrange with busy faculty and students.

While PBL and POL are effective teaching and learning methods, they need to be implemented by librarians and faculty in a different way than is possible in traditional one-shot library instruction. Library instruction must change to allow PBL to function effectively. Academic librarians need to work to change research assignments so that they work within PBL/POL. The remainder of this article will discuss research assignments and how they can be changed to support discipline-situated learning.

Traditional research assignments: The good, the bad, and the ugly

Academic librarians are regularly called upon to support research assignments. Since they often do not participate in the creation of these assignments, librarians frequently become aware of them when students begin to appear at the reference desk requesting research assistance. Such assignments provide opportunities for point-of-need IL instruction at the reference desk. Some assignments require little or no library research, and consequently little IL instruction is involved, as students don't come to the reference desk or receive library instruction, even though source research using library resources could improve such assignments. An example is the following typical field-observation assignment from an organizational communication course:

Organizational Communication Assignment

Each student will select an organization to observe in weekly 1-2 hour sessions. Students will keep a journal of their observations of the organization. Students will share their observational experiences in weekly reports to the class. Students will write three short papers and one longer paper based on their research experience. Papers should be written to the specified lengths using APA style. Information needed to complete the assignments is located in the course readings.

Organizational Structure Paper (3 pages): Students will construct an organizational chart of the organization which they are observing and analyze the type of structure that characterizes this organization.

Network Analysis Paper (3 pages): Students will administer a sociometric survey of their organization and analyze the communication flow within the organization.

Diversity Paper (3 pages): Students will analyze the organization's diversity, applying concepts from the reading.

Final Research Paper (5 pages): Students will write a paper summarizing their research experience and applying concepts from the reading.

This assignment is problematic when examined in the light of natural learning. The context of this assignment is the students' course rather than their chosen profession, and its goal is the production of an academic research paper. The lack of real-life context denies students participation in any community of practice involving organizational communication outside of academia. Because students work individually on this project, they miss the learning that can occur in collaboration with others, especially the scaffolding that more expert students can provide weaker members of a group. Also, because the assignment is done as a purely academic exercise, the organization that participates in this observation derives no benefit from the research. Finally, because students are limited in their resources to the course readings, there is little opportunity to engage with the larger disciplinary literature on communication within the students' chosen organizations. Students are constrained to the information that their expert instructor has provided for them; they are not encouraged to find information on their own.

Students could benefit from research that prepares them for their observation by making them aware of potential communication issues in their chosen organizations. Lacking source research, the assignment privileges observational research over library resources on the organizational context, and the assignment is thus not helpful even to those students who envision an academic career. Source research is at least important for a literature review in a scholarly paper or article, and source research in the context of this assignment offers students an opportunity to engage in critical thinking *vis à vis* the field's writings on the type of organization under investigation. Source research facilitated by a subject specialist librarian could quickly and efficiently teach students discipline-specific research and enrich this assignment with information that would support and enhance the observational analysis.

Other assignments like research papers bring students into the library and to the reference desk, but they generally don't promote natural learning, either of disciplinary content or of

information finding and use within the discipline. There is no context provided for such assignments or justification for the research and writing, as research papers are not situated in most students' current or future lives, beyond the need to complete course requirements and achieve a grade. Such an assignment can also become a numbers game for both students and the librarians in instruction and at the reference desk, as students must accumulate the proper numbers and kinds of sources required by their assignments (regardless of their appropriateness for students' topics). The “numbers game” also detracts from attention to critical thinking and evaluation of sources (Leibiger 2010).

Powerful Information literacy assignments

Jacobson and Mark (1995) point out the need for academic librarians to expand IL instruction beyond information-finding sessions to other areas of the research process and recommend collaboration with course faculty in the creation of assignments and in teaching IL skills beyond catalog and database searching. Palscinar and associates (1989) demonstrate the value of collaboration with faculty in the interest of promoting student active, collaborative learning. Academic librarians possess disciplinary knowledge and advanced information-finding skills, and they are cognizant of IL standards and teaching methods, all of which can be beneficial to faculty seeking to create discipline-embedded research assignments. The liaison model currently prevalent in academic libraries supports the role of the librarian as information and instructional specialist who plays an active and collaborative role with departmental faculty in enhancing disciplinary instruction via effective library assignments (Rader 2001).

Creating situated, problem-based or project-oriented, discipline-specific assignments that reinforce IL skills is not difficult with help from a librarian subject specialist/liaison. Most academic libraries have lists of subject specialists available on their web pages (see, for instance, <http://www.usd.edu/library/subject-specialists.cfm> for a list of the University of South Dakota

University Libraries’ subject-specialist library faculty). The liaison model calls for subject specialist librarians to be visible and proactive in their liaison departments and programs. Academic librarians can make faculty aware of the IL learning outcomes articulated in the *ACRL Information Literacy Competency Standards for Higher Education*. Subject specialist librarians are also aware of discipline-specific IL standards (e.g., in anthropology, political science, psychology, and sociology). The ACRL Instruction Section maintains a wiki, *Information Literacy in the Disciplines*, which collects IL standards, professional standards, and resources that support subject-specific IL instruction for many disciplines including the social sciences (ACRL Instruction Section 2010). Discipline-specific professional standards can also function as IL student learning outcomes, especially as they relate to information-finding, evaluation, and use; and critical thinking.

Once learning outcomes have been selected, a real-life scenario, problem, or task from the discipline that students are likely to encounter professionally or personally can be selected or developed. For the reinforcement of IL skills, the finding and critical use of information must be essential for the successful completion of the task. This assignment should be problem-based, so that students learn problem-solving methods within the context of the community of practice in their discipline. This provides the opportunity for cognitive apprenticeship. The problem should be ill defined or “fuzzy,” so that students are forced to engage in metacognition and thus learn how their discipline solves problems. Group work enhances opportunities for collaboration, scaffolding, and co-construction of knowledge. It’s important to allow time for collaboration, reflection, articulation, and sharing. In this problem-based model, the course instructor and the librarian become “guides on the side” rather than “sages on the stage” (King 1993, 30), providing support and modeling expert disciplinary behavior rather than functioning as the privileged conduits of disciplinary information to students in the course. Duch (1996), Carder,

Willingham, and Bibb (2001), and Macklin (2001) provide good advice on creating problem-based scenarios and guiding students through active, collaborative learning via authentic, situated assignments.

Using the IL standards to determine student learning outcomes and Herrington and Oliver’s (2000) characteristics of authentic, situated learning to create a real-life teaching scenario, the organizational communication assignment discussed above can be revised as an active, situated-learning PBL/POL exercise:

Organizational Communication Group Project

As a Communication Studies graduate, you’re employed by a small consulting company, ComConsult, Inc., that specializes in analyzing and recommending improvements in organizational communication for for-profit and nonprofit organizations. Your CEO has received several requests for the company’s services and has assigned them to the company’s consultant teams. Within the next two months, your team is to learn about the type of organization you’ve been assigned and specific communication issues within that type of organization, create and carry out a plan for observational research of the organization and its communication, and write and present a report of your findings to the organization’s leadership. Follow-up to the report, in which the organization’s feedback on the report should be addressed, is due in three months.

This exercise is a group field-based learning version of POL, in which students engage with a problem, then participate in observational research in the field (i.e., within the organization) and finally express their learning in a product. It is shorter than the earlier version of the assignment presented above, and this brevity is due to an intentional gap, which becomes part of the problem that students need to solve (i.e., How should they create a plan to carry out the field work? How should they do the preliminary research, and how should that information

be integrated into the observation? How should they use the source and observational research to create the final product?). The task is loosely defined, allowing the group to engage in metacognition and determine its own process that will give rise to the final product. Information finding and use are built in and critical for this assignment, which calls for source research to provide knowledge of the organizational context and communication issues associated with that context that can inform the observational field work.

In this scenario, the course instructor can function as the CEO, soliciting campus or community organizations that have an actual need for organizational communication consultants. The group work is thus couched in terms of a real-life task that graduates would encounter in a work situation. Performing a genuine service to the organization being observed heightens both the authenticity of the task and the value to all participants. The timeline is not the artificial one of the academic semester, but of months. If necessary, students can call upon the course instructor and an academic librarian subject specialist for scaffolding and the modeling of expert behavior in discipline-specific information finding and use, critical thinking, and creation and presentation of the final product. The librarian can function as an expert consultant for the group, leading it as a metacognitive coach in the preliminary research and in any further research that the group feels it needs to carry out the project.

Situated learning assignments and IL instruction

The discussion of library instruction above indicates that academic librarians are constrained by the small amount of time that they are provided for IL instruction in higher education courses. Generally, faculty devote one class meeting to library instruction. This time constraint causes many librarians to resort to lecturing, in order to make best use of limited instructional time. Others engage in active-learning and PBL methods, but the time constraint often limits the teaching to information finding for a specific assignment.

PBL enables librarians to play two important roles in instruction, and these roles can serve to enhance their position in higher education. First, they collaborate with faculty in the creation of problem-based or project-based assignments. This synergy is beneficial for both parties. Faculty gain from working with a library subject specialist who is an expert information specialist with pedagogical experience of IL instruction. The likelihood that students will learn IL skills when the relevant assignment is created by a faculty member and a librarian who specializes in the course discipline is heightened when the two collaborate. Additionally, having librarians support a discipline-situated assignment ensures that IL skills will be taught with due attention to the disciplinary context. The resulting collaboration is invigorating for both parties, as Cheney (2004), Kenney (2008), Lindstrom and Shonrock (2006), Pelikan (2004), and Spence (2004) have reported.

A situated learning assignment like the one given above can best be handled by librarians outside of classroom instruction, thus removing the problem of time constraints imposed by the one-hour, one-shot library session. In the PBL model, learning groups are assigned tutors and librarians who scaffold their information finding and problem-solving and thus their learning (Eldridge, 2004). Students engaged in the type of assignment described above are primed to make good use of the subject-specialist liaison librarians associated with their academic departments, who can function as expert information finders and disciplinary tutors to assist students in learning about their organizations and the communication issues associated with them, as identified and analyzed by scholars. Students thus benefit from a situated assignment and more time on task with a subject specialist supporting their research to enhance their success as researchers. Librarians gain stature as co-teachers with faculty and metacognitive coaches for students in the PBL model (Gallagher 1997; Macklin 2000). This is a positive development when compared with the adjunct status that currently accrues to academic librarians as they support

faculty assignments, without having played any role in creating or vetting them as tools for IL instruction or supporting them beyond providing short information-finding sessions. Students and faculty can be counted on to “talk up” this kind of instruction, which is the best marketing that a library instruction program could wish for.

Another source of support for situated learning assignments is the reference desk. Assignments that emphasize both the research process and disciplinary knowledge will bring students to the reference desk for assistance, especially if the assignment is crafted so as to privilege both resources that disciplines value (not Google!) and the research process over results. Rethinking research assignments so that students have strong disciplinary reasons to use high quality information sources will bring students to the reference desk and work against the “end of reference” that is regularly proclaimed in library professional literature (Gayton 2008). Saunders (2003) has argued that effective IL instruction brings students to the reference desk for assistance. PBL-based instruction, which focuses on the resources and research processes used by disciplinary experts, has been documented as providing students with greater incentives to use the library and better resources than Internet search engines more than traditional teaching (Albanese and Mitchell 1993; Rankin 1992; Saunders, Northup, and Mennin 1985). Subject specialist liaison librarians staffing the reference desk support faculty teaching and student research success, providing free marketing for the library. Underlying these instructional developments is the need for faculty and librarians to collaborate in creating assignments that allow liaisons to “shine” as disciplinary coaches.

Assessment: As ye teach, so shall ye assess

Assignments that are intended to reinforce IL skills need to be assessed with attention to those skills. If particular IL learning outcomes have been chosen for an assignment, students need to see that the desired behavioral outcomes are addressed in grading criteria. Fortunately,

this is easily accomplished. The AAC&U (2010), in espousing IL skills as learning outcomes of higher education, has produced an IL grading rubric that is available online. The rubric enables the assessment of students according to each of the five ACRL IL standards along four levels of competence (Benchmark, Milestone 1, Milestone 2, and Capstone) that can be aligned with stages in students' academic careers or disciplinary or professional development. The rubric lends itself to use in grading both traditional research assignments and situated, collaborative ones.

Librarians, as IL experts, can also participate in grading the project (in this case, the organizational communication report) as a research project/product *per se*, or, since they have participated in and observed the group research work, they can participate in the overall grading of the project. Group work can be graded holistically (i.e., the product can be graded and a single grade assigned to the group), but individual performance and effort should also be included for each individual, based on faculty, librarian, and group member observation of the group's members (Snively 2004). Including IL within a holistic grade reinforces the importance of the research process within the students' work on the project. Of course, the client organization can also provide input to the project grade, at least in terms of its satisfaction with the project report.

Continuous improvement

Ideally, students should participate in numerous PBL-type assignments throughout their course of study. This trains the mind to engage automatically in problem solving in course work and in later professional and personal situations. Repetition also allows instructors and librarians increased opportunities to collaborate on PBL-type assignments and engage in situated learning with students (Cheney 2004; Pelikan 2004; Spence 2004). Any such research assignments should be evaluated by all participants, and comments should be used to improve the assignments. By providing feedback, students also participate collaboratively in the continuous improvement of

learning scenarios.

Conclusion: Combatting Googlitis via collaborative IL instruction

The answer to the problem of Googlitis in higher education is not to forbid the use of Google among students. Rather, a discussion of the pros and cons of relying on Google for research is necessary within the context of course and disciplinary research. Allowing students to use Google or other search engines when appropriate and pointing out the limits of search engines in accessing quality information located in the Deep Web can lead to nuanced discussions about research and the need for IL skills. Having students compare information on academic subjects gleaned from search engines with that obtained via research databases within active learning can provide the impetus for a better understanding of the appropriate utilization of tools to accomplish specific tasks using the Web.

Providing IL instruction via situated, discipline-specific assignments crafted and facilitated collaboratively by faculty and librarian subject specialists offers students the point-of-need impetus to learn both the knowledge and skills that enable and entitle them to participate in their chosen disciplinary communities of practice. Making IL skills an implicit part of any discipline-based task or problem grounds information-finding in the epistemology and practice of the field. Enhancing students' IL skills within the context of a discipline has a positive effect on students' information-finding and critical-thinking abilities and enhances their ability to deal with information in academic, professional, and personal matters. Students discover for themselves the value of library resources and the paucity of high-quality information available through Internet search engines. Finally, by engaging students in discussions about research and resources and by reinforcing students' IL skills via powerful assignments in upper-division courses, faculty and librarian experts can collaboratively intervene to deter Googlitis and render students Googledexterous rather than Googleimpaired (Urban Dictionary, 2010).

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