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A rationale for information literacy as a credit-bearing discipline.

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Abstract

Purpose: While the need for comprehensive information literacy in today's society is becoming increasingly apparent, and initiatives abound within local, regional, national and international educational venues, there is evidence that information literacy within higher education today is failing to meet its dual intentions of becoming credible within the academic community and pervasive within university programs. The goal of this paper is to present a more rigorous approach to information literacy as a credit-bearing discipline.

Approach: Following a literature review, the paper will propose an educational rationale for information literacy as a discipline.

Practical Implications: If a proper educational rationale can be determined for information literacy, this can become the basis for actual information literacy credit programming within institutions of higher education.

Originality/Value: While the idea of information literacy as a liberal art or a discipline is not new, this paper is the most comprehensive attempt to date to provide a rationale for information literacy as a credit-bearing discipline.

Keywords

Information literacy; credit-bearing courses; higher education

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The information literacy movement has grown dramatically over the past quarter century. Several sets of rigorous national standards have been established, a large body of research has been published, and many library faculty positions are devoted to library instruction. Yet the actual level and extent of instruction to students in many colleges and universities remains low. The vast majority of instructional librarian time is spent doing one or two hour sessions at the invitation of subject faculty or providing basic generic instruction to incoming freshmen. Few professionals in the field would argue that such limited exposure to information literacy instruction can fulfill the goals of existing standards in and of itself.

Peter Drucker, the premier management expert of the Twentieth Century, described the outcome of inadequate information literacy instruction with the

following analogy: “In today’s organization, you have to take responsibility for information because it is your main tool. But most don’t know how to use it. Few are information literate. They can play ‘Mary Had a Little Lamb’ but not Beethoven.” (Harris, 1993, p. 120)

The importance information literacy is well captured in the statement of Christine Bruce (2002): “Information literacy is the natural extension of the concept of literacy in our information society. Information literacy is the catalyst required to transform the information society of today into the learning society of tomorrow.”

To argue that information literacy should have a higher place within academia is certainly not new (most recently, Owusu-Ansah, 2007), nor is the discomfort that many information professionals feel about the disparity between the needs for an information literate populace and the amount of education in the use of information that they are able to provide. It is the premise of this paper that true information literacy will not become a reality until it is elevated to the status of an academic discipline that has a confirmed role within the curriculum.

I. Determining the Need

The need for information literacy within higher education is hardly open to question among information professionals. A few examples will suffice.

In 1991, the US Department of Labor’s Secretary’s Commission on Achieve Necessary Skills produced a report looking at five benchmark skills required by the modern workplace. One of these was information literacy, by which the worker, “Identifies the need for data, obtains it from existing sources or creates it, and evaluates its relevance and accuracy.” (Martin, 1991, p30). The report considered the role of education in developing required skills and found that schools and industry were often at cross purposes with regard to abilities needed to function at work. “Students will not acquire what they need to progress in life by osmosis, either in school or in the workplace… Today’s schools must determine new standards, curricula, teaching methods, and materials.” (p16)

Bonnie Cheuk’s (2002) study on information literacy in the workplace context detailed gaps in worker information literacy skills that lead to loss of efficiency and business opportunity. She pointed out how closely these deficiencies parallel the ACRL Information Literacy Competency Standards for Higher Education and argued that, “Information literacy will eventually become basic literacy skills comparable to language and numerical skills.”

Susan Felman (2004), Vice president, Content Technologies at International Data Corporation has reported on years of research on information use within corporations. Her findings are that while knowledge workers spend 15% to 35% of their time seeking information, they report finding the information they desire

only 50% of the time. At least 15% of knowledge created already existed but was not found.

Moody and Walsh (1999) made a case for information as a "strategic business asset," arguing: "There is little point in improving the accuracy and timeliness of data if people don't know how to use it effectively. Equal emphasis, therefore, needs to be placed on improving people's information literacy skills as improving the quality of information itself." (p6)

F. Anthony Comper, president of the Bank of Montreal, commented on the growing need for information literacy in the workplace: "What we in the knowledge industries need, preferably in an endless stream, are people who know how to absorb and analyze and integrate and create and effectively convey information. And who know how to use information to bring real value to everything they undertake." (*ACRL - advocate for IL,* 2003)

It may be argued, however, that expressions of need from the workplace, even a call for students in higher education to have information skills, should not necessarily govern the development of the university curriculum. All too often the essentials of curriculum – philosophical base, program integration, higher order thinking – are subsumed to the demands of a marketplace that does not understand that university education is more than training for a career. This could be a valid complaint were it not for the fact that we are all – marketplace, university and general populace - located within an information age that places high value on efficient and effective acquiring and use of information.

Within academia, it is often asserted that the same failings found in the workplace are diminishing the level of scholarship done by students. Bundy's (2004) article calling for a joining of information literacy and information technology fluency pointed out that the various levels of formal education – primary, secondary and tertiary – are not connecting with one another in development of these essential skills. "Nor do they usually demonstrate that they have really grasped the implications of a world of infoglut, or the impossibility of an information illiterate person being able to be a lifelong learner and a full participant in society." (p8).

His view is shared by others. Whitehead and Quinlan (2003), speaking to the gap between what is needed in information literacy and what is actually being done in Canadian universities, argued, "At the root of the problem is the fact that information literacy is rarely addressed as an educational objective and therefore is not systematically covered in academic program curricula." (p11). Their assessment of current progress was that, "Information literacy initiatives in Canada remain on the margins of the education process, much to the detriment of Canada's workforce and economic potential." (p5)

Maughan (2001) demonstrated that information literacy inadequacy in higher education is leaving university graduates devoid of the very skills they require to function well within the information workplace. Surveys administered to senior undergraduates at the University of California-Berkeley in 1994, 1995, and 1999 showed that students consistently over-estimated their research ability, while, of eight discipline-specific groups of students studied, five showed failing scores even on measures of lower order information literacy. Similar findings were observed in a 2003 study of 330 incoming graduate law students, who believed their research skills were well advanced, while they failed dramatically in an actual test of skills ("2003-2004 completed research grant projects"). Perrett (2004) found that 81% of incoming graduate students required further information literacy instruction in order to meet educational standards, though many of them had self-rated their skills as good or excellent. Such results are no surprise to university reference librarians who observe significant gaps in student information literacy, even at the senior levels, on a daily basis.

In the face of growing use of Internet search engines by students, research consistently shows that 45% or more of students, even graduate students, use search engines such as Google as their initial search tools in research (Griffiths & Brophy, 2005; Liu & Yang, 2004, p26). This demands that one question whether or not students do well searching even with Google. Research, once again, shows that they do not (Griffiths & Brophy, 2005).

One must further ask whether or not students are acquiring higher level information literacy skills, such as the ability to discern among various sources of information or to evaluate the information they do find. Wang and Artero (2005) in a study of Internet use among 647 students, found that 40% believed that information found through an Internet search engine was as reliable as that in books and journals, while a further 33% were undecided on the issue. Though 78% reported that they evaluated Web resources before using them, 58% indicated that they would use a piece of information so long as it fit with their point of view. The authors concluded that students were creating their own highly subjective evaluation criteria. "Although the students in this study judged that they had critically evaluated Web information, their responses to the survey questions showed that they were not equipped with sufficient knowledge and skills to critically evaluate Web resources." (p80)

It is regularly asserted, as well, that in many universities worldwide, while information literacy may be on the agenda of the institution, the actual practice tends to be at the level of short, optional instruction rather than training that rests solidly within the university curriculum (Corrall, 2007; Owusu-Ansah, 2007).

II. Existing Initiatives

Since the mid 1970s, information literacy has taken on growing importance within national educational planning, accrediting organizations, and educational

institutions. While the following is only representative, the extent of initiatives around the world is impressive.

American statements on information literacy abound, from the US Department of Labor's report, "What Work Requires of Schools," which lists as one of five competencies, "Information - acquiring and evaluating data, organizing and maintaining files, interpreting and communicating, and using computers to process information" (Martin, 1991, p10) to the US Department of Education's National Educational Technology Plan presented to Congress, which sets as one of its five goals that, "All students will have technology and information literacy skills." (Riley, 2000, pp6, 39-44). The Association of College and Research Libraries has developed standards for information literacy (Association of College and Research Libraries, 2000) with a number of accompanying guidelines (Association of College and Research Libraries, 2001, 2003a, 2003b)

Other countries have followed the same pattern with extensive position papers and standards. Australian and New Zealand university libraries have created a comprehensive information literacy framework (principles, standards and practice) that has adopted the ACRL standards but added two more sections related to creation of new information and lifelong learning (Bundy, 2004a). In Australian higher education, the concept of "information literacy" is well accepted, and various types of training are in use, though a comprehensive instruction framework is still difficult to attain (Peacock, in Lau, 2007, p7-23). Fafeita (2006) reported increased information literacy initiatives within the Technology and Further Education sector in Australia, though actual research instruction was minimal and there were barriers to further development, including lack of resources, and lack of understanding from subject faculty and administrators.

The Canadian Association of Research Libraries has developed its own Information Literacy Policy Statement and created an Information Literacy Working Group (Canadian Association of Research Libraries, 2005). At least one institution, University of Alberta, Augustana, has an extensive set of discipline-oriented credit courses (University of Alberta, 2007; Goebel & Neff, 2007). Whitehead and Quinlan (2003), however, are pessimistic about the extent to which information literacy has been integrated into most universities' academic agendas.

In Britain, following upon the Society of College, National and University Libraries 1999 paper "Information Skills in Higher Education," (Society of College, National & University Libraries, 2003) the Big Blue Project was established to survey higher education information literacy efforts and ensure "a coherent approach to the development of an information literate student population in the UK" (The Big Blue). The British-based Chartered Institute of Library and Information Professionals has produced a comprehensive definition of information literacy and its components, thus essentially laying out the standards to be met in information literacy instruction (Chartered Institute of Library and Information

Professionals, 2006). Several universities have developed credit courses either live or online, and the number of tutorials and other information literacy instruction resources is growing (Virkus, 2003). At the same time, Webber and Johnston (2003) found a "prominence of the library, digital resource, and IT skills orientation over Information Literacy" in many initiatives. For more comprehensive surveys, see Webber and Johnston (2003) and Webber and McGuinness, in Lau (2007, p121-133)

In Continental Europe, information literacy is gaining increasing prominence within higher education, particularly in Scandinavia, where the number of courses and comprehensive courses available is growing rapidly (Virkus 2003). The NordINFOLIT collaboration, though lacking government funding, provides a venue for Nordic countries to share information and resources. Spanish Universities offer a number of optional information literacy courses (Pinto & Sales, in Lau, 2007, 84). Virkus (2003) notes, however, that in Europe there is a lack of government interest and initiative in information literacy programming, though training in technological skills is significant. See also the survey by Rader (2002).

In other parts of the world, information literacy is of uneven quality and extent. Lau (2007, p33) reports the information literacy in Latin America is a "scattered activity" mostly found in private education. An online course in Mexico is being used among nearly thirty universities. In African countries information literacy is generally taught within courses on computer and information skills (Fidzani, in Lau, 2007, p116). While still uneven, the African experience is robust where information literacy is taught, as, for example, the case study of Wema & Hepworth (2007). In South Africa, during a time in which higher education is undergoing significant change, several institutions are now offering mainly generic information literacy credit courses (Jager**,** Nassimbeni & Underwood, in Lau, 2007, p161).

International information literacy initiatives abound: In 2003, information professionals from 23 countries in all 7 continents met in Prague for The Information Literacy Meeting of Experts, resulting in The Prague Declaration, calling for information literacy to be "an integral part of education for all." (Thompson, 2003, p1) UNESCO, under the mandate of a 2001 UN General Assembly resolution, has held two World Summit on the Information Society conferences in Geneva in 2003 and Tunisia in 2005, which produced the "Geneva Declaration of Principles" and the Tunis Commitment". (*World summit on the information society, Geneva 2003 - Tunis 2005.*2006) The Information Literacy Section of the International Federation of Library Associations and Organizations (IFLA) has sponsored the creation of a comprehensive statement of "International Guidelines on Information Literacy" (Lau, 2004). The result of the UNESCO sponsored *High Level Colloquium on Information Literacy and Lifelong Learning* in Alexandria, November 2005, was a large report along with the

Alexandrian Proclamation on Information Literacy and Lifelong Learning (Garner, 2006).

III. The Perceived Inadequacies in Information Literacy

All of this activity should be encouraging to most devotees of information literacy beating, but the reality is that much of the literature being produced by this growing movement is found within the circles of librarians and information professionals, not in the mainstream academic community. While there are scattered instances of universities and even nations or geographical regions adopting information literacy educational criteria and using them to develop programs with measurable outcomes, there are few institutional, let alone national, strategies that are actually succeeding at the level of comprehensive instruction. With all the energy being put into agendas for information literacy, we should surely by now be seeing significant results in student populations. But studies continue to report that most students are not exhibiting information literacy knowledge and skills that meet the common standards, such as those of ACRL.

Part of the difficulty is that many initiatives tend to see information literacy as a series of skill sets, with the implication that a corresponding series of training opportunities will make students literate with information. This is overly optimistic when one considers the knowledge base that accompanies true information literacy – What is information (or can we even speak of "information" as a singular entity in our Postmodern age)? Where does it come from? Who determines that it is published or that it takes the form that it does? What is the difference between a scholarly journal article and a webpage (or is that even a legitimate question, considering the confluence of formats available for information today)? Why do I have to pay for some information while I do not have to pay for other information? What is metadata, and how can it help me? What are the implications of electronic searching and electronic documents for the way we do research? How do we evaluate what we have found? What are the legal and ethical considerations that will have an impact on what is available to us and how we can use it?

It is one thing to create a tutorial or hold a class to teach someone how to search a database. It is quite another to help that same person to navigate the troubled waters of the information revolution with such skill that the right information for the task is effectively and efficiently found, evaluated, and then used to optimum advantage within legal and ethical boundaries. Teachers of information literacy all too often concentrate skill sets (Corrall, 2007) while the overarching framework of understanding the nature and proper use of various information sources (the philosophy of information) is simply not taught, though it is clearly delineated in standards like those of ACRL (Association of College and Research Libraries, 2000).

Another challenge comes from the ever-present reality that subject faculty still tend to see information literacy instructors as intruders and thus remain resistant to implementing it beyond allowing the occasional class session for "library instruction." Information literacy is not generally on the agenda, in any significant way, of the average history or sociology or physics class, even though its students are expected to use the skills of information literacy in course assignments. (Hardesty, 1995; Badke, 2005)

A great deal of what passes for information literacy is really old style bibliographic instruction in the form of single sessions that major on library use. There are, to be sure, strategic initiatives in university systems such as California State University (*CSU information competence project,* 2001) and The Five Colleges of Ohio (2006), as well as national initiatives like the Big Blue of Britain (The big blue) and the Australian and New Zealand Information Literacy Framework (Bundy, 2004a). But most universities and university systems lack such comprehensive programs. The statement by Webber & Johnston (2003) that UK universities are characterized by "a limited appreciation of the wider implications of the information society for higher education curricula, teaching and learning," summarizes the findings of many studies worldwide.

As a result of tentative and abortive efforts to make information a viable part of higher education, the movement, even as it is growing, is beginning to run out of energy. In 2005 the Canadian Library Association conference included an agenda item entitled, "The Great Debate: Be it Resolved that we Teach them Nothing - Library Instruction Doesn't Work" (*Rediscover the Library Movement,* 2005) To be sure, the proponent view failed, and the conference's business meeting passed a resolution to make information literacy a priority in its advocacy, but the fact that it was even debated at national level shows cause for concern.

The 2006 ACRL President's Program at the American Theological Library Association convention of June 2006 was a debate on the resolution: "The Emperor Has No Clothes: Be It Resolved That Information Literacy Is a Fad and Waste of Librarians' Time and Talent" (ACRL in New Orleans*,* 2006) Such a debate in no way proves that information literacy is dead, but it does signal a growing opposition based primarily on the premise that what has been promised in this movement has not been delivered in terms of real advances within the student population.

Why, then, given the power of so many initiatives, is information literacy struggling to find a place in higher education? Librarians would probably blame subject faculty and academic administrators who refuse to advance the information literacy agenda. Librarians may well feel that those in academia see little need to increase the role of information literacy in the curriculum and rarely understanding what the information literacy movement is seeking to accomplish. Front line information literacy instructors could point to the enormous number of

single sessions that they teach to a bored and resentful student body. The academy in general could argue that the segregation of information literacy research within publications that only librarians read makes the whole movement peripheral.

This paper will argue that, while all of these factors may be part of the problem, the real failure of information literacy to this point is that it is simply not robust enough. To invoke the analogy of Peter Drucker (Harris, 1993, p. 120), today's information literacy has "Mary Had A Little Lamb," not Beethoven, written all over it. To this challenge we now turn.

IV. The Discipline Called "Information Literacy."

Information literacy has been studied extensively. It has been defined, standardized, discussed, debated, initiated, discussed, re-defined, and so on until most scholars in this field now believe they have a fairly good idea of what it entails. They have generated best practices for teaching it (Association of College and Research Libraries, 2006), and they have guidelines for instruction programs in academic libraries (Association of College and Research Libraries, 2003b). But have they fully understood what creating an information literate student population actually entails?

Let us consider the average information literacy initiative in a university. It may begin with a generic single session of an hour or two, which generally focuses on the tools of research. This may be followed up by subject-specific sessions, sometimes with a small research assignment, or even by significant credit-bearing components of information literacy within existing courses, usually tied to an assignment, but often governed more by the pedagogical goals of the subject faculty member than those of the librarian instructor (who is a guest in the classroom, no matter how collegial the arrangement may be). A smaller number of universities (perhaps 30% according to Shirato and Badics, 1997) offer one to three credit courses either as stand-alone offerings from the library or within subject disciplines. Very few of such courses are part of the required core.

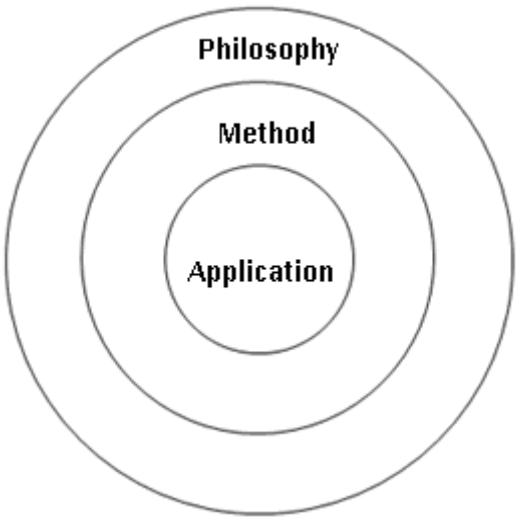
The results overall are disappointing. Students continue to use Google as their primary doorway to information, many of them fail to appreciate the value of gatekeeping in the production and publication of scholarly books and articles, and search skills in the electronic environment remain minimal. Studies of incoming students in postgraduate programs show significant gaps in information literacy that presumably should have been filled in undergraduate programs ("2003-2004 completed research grant projects;" Perrett, 2004) The result for the marketplace is that workers, who for the most part depend on information for much of what they do, have a poor understanding of the nature of the information they are working with, waste large amounts of time acquiring it (if they find it at all), and use it in inappropriate ways that put the enterprises they work for at risk. Many graduated students come into the workplace performing inadequately in

the realm of information handling, even when they have passed through our information literacy programs.

The time has come to recognize that information literacy needs to move to the next level and be considered a viable, core academic discipline that is taught with the same rigor as any other discipline. Not only must information literacy achieve full academic status, but it must be required in every program in higher education. The ability to handle the information that comprises the heart of academic study is foundational to genuine education in the information age.

What would such an academic discipline look like? First, it would most likely locate itself at various points in the curriculum, finding the subject content with which it works in the majors of the students who takes it. Such multi-faceted disciplines already exist in the form of philosophy, ethics, and so on. The discipline of ethics can form a good analogy as it ranges through the academy as philosophical ethics, bioethics, business ethics, professional ethics, and so on. While the philosophical framework within which it operates has a strong consistency, it works out its methodology and application in different ways, depending on its subject matter.

Second, it would consist of three elements in concentric circles. The outer consists of philosophy, within which lie method/strategy, and the innermost circle is application:



Why should we make our students deal with the philosophy of information as well as learning research method? We should do so because, all too often, information literacy instruction begins and ends with application - the skills of information acquisition and evaluation, often involving learning how to search databases and how to use of evaluation checklists. The application realm of information literacy, however, is the most changeable and thus the least likely to

be valued in the long term of the student's academic studies and workplace experience. What is more, teaching application without teaching method and philosophy is akin to showing someone how to steer and use the brakes on a car without teaching overall driving technique and the rules of the road.

V. The Epistemology of Information – Framework for a Philosophy of Information Literacy

There was a time in which the concept of "information" could be summed up as "that which provides us the foundation for the discovery of truth." Postmodernism and Poststructuralism have challenged the assumption that the sources of our information are sufficiently objective and values-neutral to make the acquiring and use of information a task for skill development alone. Kapitzke (2003), for example, has argued that information can no longer be seen as operating in some sort of vacuum, separated from the social and historical processes that shape it and justify its existence. Information is not neutral, nor is it apolitical.

Kaptizke goes on to call for recognition of a hyperliteracy (a literacy that recognizes the various forms and media in which information is found) to better explain the many environmental factors operating when information is created and used. Hyperliteracy includes "intermediality," the contextualizing of the information process within the worlds of the producer and user so that a constant critique of the assumptions within the whole process, and of epistemological assumptions behind it, is maintained.

This is in perfect accord with our call to have information literacy live within a philosophy of knowledge, yet it neglects one aspect of epistemology – the reality that a source of information needs to be evaluated by criteria that are more or less universally acceptable. We contextualize the information process by recognizing why the writer writes, the processes by which the information was allowed to be published, and how the reader reads it. But a proper epistemology also looks at the qualifications, presuppositions and biases of the writer.

Here we need to use criteria that clarify the extent to which the information is to be believed, relied upon, or used for the purpose it appears to be seeking to achieve. Unless our epistemology makes a god of subjectivity, any philosophy of knowledge has to ask questions like "Who wrote this? Does she have the required knowledge base to make her writing reliable? What presuppositions have set the direction for her approach to this topic? What value will this piece of information ultimately have to my quest?"

A reality that comes into play at this point is that academic information generally lives within the context of a subject discipline, within which discourse is carried out by specific though often unwritten rules that make any particular piece of evidence or product of research either valid or invalid, based on the criteria established by the discipline. We may well accept the warning of Martin (1998)

regarding the political bias within disciplines, but Keresztesi (1982) has made clear in his pioneering article, "The Science of Bibliography," that the recognition of an area of study as a discipline with the university is the only way for it to achieve widespread approval in society.

Keresztesi clarified the way in which information literacy (or, in his older terminology, "bibliography") could work as a discipline within the context of an existing subject area. He pointed out that there are two kinds of discipline-related knowledge. One relates to "structural manifestations," that is the depth and substance of the subject matter. The other relates to "surface or topographical manifestations." This second dimension deals with epistemology – the factors that the discipline values in its search for knowledge, the norms it recognizes, and the research and communication processes it uses. Topography is that part of discipline-related knowledge that is the special sphere of "bibliography." Keresztesi argued that, not only was topography generally unimportant to the scientist's interests, but it was territory so far only staked out by bibliographers. That same territory now lies in the hands of the information literacy specialist.

Thus, in any philosophy of information literacy as a discipline, the role of subject disciplines, particularly their topographical manifestations, must be integral. A relevant model might be that of a core information literacy course within each major, where it can be informed by the discipline involved (Badke, 2003, 2005), though, of course, the material could be embedded in one or more courses within a discipline. While a generic information literacy course could deal with the philosophical purposes in a minimal way, a full-blown philosophy of information literacy would have to take the appropriate subject discipline(s) into account.[1]

VI. The Methodology of the Information Quest

Information literacy instruction in practice has often lacked a coherent methodological core. Part of the problem has been the fact that much of what passes for information literacy in practice is really bibliographic instruction that focuses only on information acquisition. But, even when there is a clear philosophy of information literacy in place, the idea of a guiding method that shows students how to move from point A to B to C is often lost in the rush to move from philosophy to application. This creates what might be called an architectural model of instruction – here is the catalog, these are the databases, and here is how you use them. An overarching research methodology, consisting of strategies-based approach based a research model, is required in the place of mere application.

[1] An alternative view is presented by Webber and Johnston (2000), who argue that "information literacy can be taught as a stand-alone subject in its own right and does not have to be incorporated into other classes to be meaningful to students." (p393) Their case, however, is a rejection of the often fragmentary nature of the through-the-curriculum model, rather than a lack of appreciation of the role of subject disciplines

Research models, however, are open to criticism. The widely used information processing model that sees a progression from data to information to knowledge has been criticized by many as being too structured and not open enough to the possibility that information can just as easily lead to confusion. Marcum (2002), in particular, has pointed out that knowledge is not organized information but a quantum leap from information to cognition, understanding and experience. He argues: "Knowledge is not certainty but is a set of beliefs about causal relationships between phenomena." (p12). Further, Marcum points out that the information processing model, as well as most information literacy models, fail to take into account the crucial role of the researcher in formulating knowledge. "Too little acknowledgment is afforded to the context brought to the process by the learner." (p12)

We might, therefore, assume that there is no methodological framework, no research model, within which we can lodge instruction. Knowledge acquisition is indeed an eclectic and multi-party process involving acquiring data, making sense of it, considering both its biases and ours. Thus it may well be that defining a single research method is at best artificial and at worst impossible. But the alternative is simply to explain to our students how information works within the discipline and then turn them loose on the tools without giving them any process to follow in moving from point A to Z in their research.

There is a time-honored methodology available to us, however, that can answer most of the methodological doubts we have raised to this point. It is the scientific method. Instant objections can, of course, be raised – the scientific method too is artificial, limits creativity, and is too rationalistic to deal with all the subjectivity involved in turning information into knowledge. But as a method it brings together the main features of most problem-solving in the human enterprise – development of a working knowledge of the issue, creation of a statement that crystallizes the nature of the to be addressed at hand (hypothesis or research question), a review of what is currently known about the issue (including a delineation of the various points of view that are held), an exercise to compile and/or evaluate evidence, and a conclusion that weighs all that has been discovered and takes a position on it. This method can take many views on an issue into account, can properly address the bias brought by the researcher, and can help discern what passes for "information" to determine its quality/usefulness/reliability in helping to deal with the stated problem.

Clearly, many students struggle in the early stages of research, not seeing a path ahead and feeling a great deal of anxiety that is not alleviated simply by providing them with a rubber-stamp method (Kuhlthau). It is a fact, as well, that the actual research process is often cyclical so that initial information gathered leads to reformulation of the research question/hypothesis, leading to more information gathering and writing, which may cause the researcher to return to the acquisition stage to bolster the knowledge base or even back to the hypothesis

once again to clarify it further. This is particularly true of research scholars, whose methodologies are varied and often appear to have no organized structure (Stoan, 1984). But we do not have sufficient reason to avoid putting the application of information literacy within a methodological framework. As Bodi (2002) has pointed out, established scholars have a knowledge base that allows for the ambiguities and potential confusion of circular research. University students, lacking a knowledge base and, indeed, any coherent sense of the purposes and techniques of the research process, flounder in their research, often rejecting whatever method they have been taught but substituting nothing better.

Bondi argues: “Librarians tend to teach a step-by-step, linear search strategy, but research, especially in an electronic environment, is interactive and circular. A coherent, flexible research model that can be adapted to various instructional sessions is necessary,
but we need to be clear that one strategy does not fit all circumstances” (p113). Without some sort of flexibly conceived framework for research method, any mechanical skills remain orphans, lacking a blueprint to determine when they should be used. The best way to instill a research methodology is to build assignments around a research process, providing examples that indicate when, and in what manner, the researcher will need to deviate from the normal pattern. In this way, students do not just have a set of tools and some skills to use them, but they also have a process by which use of the tools can lead to understanding and problem-solving.

VII. Instruction in Application Skills

Teaching the application of the information process – how to use keywords and controlled vocabularies; how to search catalogs, databases, and the Internet; how to evaluate information sources – is the predominant territory for many information literacy instructors today. Application skill is important, but as we have argued, it needs to be taught within the spheres of philosophy of information and a flexible research method if students are to bear fruit in the effective acquiring and use of information.

To use an analogy, the application of research is like a tradesperson’s skill with his/her tools. Proper use of the tools is problematic if the tradesperson has not been educated in the engineering and regulatory aspects of the trade and has not developed expertise in using the right tool to accomplish each stage of the task.

VIII. Conclusions

The idea that information literacy should constitute its own discipline is not a new one. Frances Hopkins (1981) proposed that bibliographic instruction (patterned

very much on the lines of current information literacy) as an emerging professional discipline could be based on the movement within the sciences called “the science of research.” The development of standards, a large literature, and defined teaching positions in information literacy now make the possibility of viewing information literacy as a discipline even more feasible, and, indeed, other scholars of information literacy continue to advocate its role as a discipline. (Peacock, 2001; Johnston & Webber, 2003)

We are not, however, thinking of a generic information literacy teaching subject area in referring to this discipline (as proposed by Johnston & Webber, 2000; Owusu-Ansah, 2004, 2007, among others). Rather, we are looking at it as a discipline with many possible venues, informed by subject matter in existing subject disciplines. Thus information literacy taught in the Communications Department would be distinct from information literacy taught in the History or Physics Departments. This is not to say that there would not be a commonality to all such courses, but each would adapt to the subject matter of its environment.

Essential to any such discipline is a philosophy or theory related to the nature of and human interaction with this nebulous thing we call “information.” Such a philosophy would recognize that not all information is created equal, that subjectivity and politics and economics and legalities all shape the information we receive as well as the way we use it, and that understanding the nature of the information we deal with is foundational to using it well.

The discipline would also have a strong process element in the flexible yet coherent research methods that are taught and in the application of skill development that is essential to proper hands-on use of information in our highly technological age. The best way to do this is to structure assignments around actual research projects in which the stages of the student’s work are critiqued. While this paper is not the venue to consider extensive details of pedagogy, the example of this author’s graduate research syllabus makes the teaching process relatively clear (Badke, 2007). This syllabus lodges instruction in study of the world of information, presents a flexible model for doing informational research, and requires extensive assignments in which students carry out actual research projects and have those developing projects critiqued at every stage.

Turning information literacy into an academic discipline could, of course, be a sterile dream in our current academic environment where getting even a one credit information literacy course into the curriculum as an elective seems nearly impossible in many institutions. What we are envisioning is a campus-wide, hopefully required, plan to lodge information literacy courses into the cores of majors or making them significant components of courses across the curriculum. The sheer logistics of altering curricula to this extent and then finding instructors to teach it may make such a proposal appear unworkable. Such, however, are

the challenges of any educational revolution, and we are, admittedly, looking for a revolution, not just a token adjustment.

Librarians know one fact that could make the difference, if the rest of the academy were to discover it – information literacy, or rather the lack of it, is the biggest blind spot in higher education today. Should the academy wake up to the reality of a world filled with people who know how to play little more nursery songs with the information tools that are essential to our economy, we will have a vision ready for a better way to do things. One day, perhaps all of our students will be able to play Beethoven.

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