Information Literacy as a Formative Force

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The question that guides this project is actually quite straightforward. Information literacy experiences are usually intended to be, in some ways, transformational for students in their academic lives. This study is specifically intended to assess the extent of the transformation. The particular methodology will be described below, but it is designed to evaluate students' operational perceptions of "libraries" and "information" at the beginning and at the end of three courses designed to teach students to think critically about information. The findings will reflect the changes. It should be mentioned that this study does not explicitly address the *Standards*[1] developed by the Association for College and Research Libraries.

The literature related to information literacy is varied and extremely large. Since the present project has a specific purpose, there is no reason to cover more than a modicum of works here. By way of general background, Tim Clydesdale (2007) conducted an exhaustive study of high school seniors and first-year college students.[2] His findings affirmed that substantial intellectual and social changes take place in a very short period of time; these changes sometimes manifest themselves in the form of exploration of the academic world and how to comprehend academic challenges. VanHoose, Farrell, Aldridge (2012), from their perspective as information literacy instructors, expressed surprise that their fondness of libraries and their role in discovery was not necessarily shared by their students.[3] VanHoose (2012) stated, "We have to work to figure out what interests them, and in order

to do that we just have to get to know them. What it all really boils down to is finding activities that keep the students interested and make learning about the library's resources something that is not completely and utterly dull."[4] We agree with this general orientation but also believe that we will need to do more than this in order to create experiences that introduce students to possibilities to "think informationally."[5]

Another important aspect of information literacy is the attitude of faculty to undergraduate research. Farrell spoke of challenges she faced in her first professional position, and expressed a desideratum in her educational program that didn't prepare her to work with faculty instruction process.[6] Leckie argued cogently for the integration of faculty into the process of students becoming both interested in and competent to pursue complex topics.[7] She mentioned the faculty, quite possibly drawing from their own research and writing behaviors, assume that undergraduates will explore a wide ranging body of literature, winnow the gist of a desired topic down to essential topical pertinence, and then compose a thoroughly researched paper. That presumption is faulty from the start, as Leckie said. Developing a faculty partnership to create a stratified, cohesive, and structured experience for undergraduate students faces many obstacles, but it is the responsibility of academic libraries to try to create such a structure.[8]

This introduction will conclude with a brief examination of the *ways* by which transforming information literacy programs can succeed. Allen suggest-

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ed adopting a constructivist method of instruction as a means of assisting students to integrate their own experiences into learning.[9] She drew heavily from learning theory in relation the development of critical thinking skills. In particular, she draws from Piaget, whose definition of constructivism emphasizes that knowledge is not "out there;" it is an active process of a knower's self-construction. We do agree that enhancing the critical thinking abilities of students should be a very important component of courses. Allen added that information literacy and critical thinking, as activities, have some fundamental distinctions.[10] One

reason she explained the difference is that critical thinking, as it may be conveyed to students, is generally (and possibly must be) introduced as abstract constructs that do not help students address their immediate, and more practical, needs.[11]

This idea is at odds with Budd (2008) who rejected constructivism in favor of cognitive development as a more productive and useful tactic.[12] He refers to Fodor[13] who suggests that "as far as anyone knows, relevance, strength, simplicity, centrality, and the like are properties, not of single sentences, but of whole belief systems."[14] The cognitive strain incorporates

TABLE 1 Course Details		
University of Missouri-Columbia	**The University of Western Ontario**	**University of Toronto Mississauga**
Teaches research skills using library and web resources. Students will learn search strategies and evaluation techniques to improve academic performance and to become successful college students. This will entail framing a meaningful question on a topic of choice, choosing appropriate sources for research, and evaluating sources for relevancy and reliability.	This course examines the nature of information in its various social, cultural, intellectual and material contexts. It starts with the history of the book and moves towards a consideration of the contested notions of an "information society". The course is an introduction to critical perspectives on the study of information.	Drawing upon conceptual foundations in information studies, this course provides an introduction to information and scholarly research including theoretical frameworks for the organization of information, critical strategies for acquiring, evaluating and communicating information, and the ethical and legal obligations of using information.
• Frame meaningful questions for research • Understand the structure and content of information resources • Evaluate available information and information sources • Use information resources as genuine learning tools	• Learn how the social, cultural and political contexts of the production and communication of information determine what counts as information in a variety of millieus. • Become critically aware of information issues by deep be deepening your understanding of the processes and institutions involved in creating and disseminating information • Become aware of the range of information resources available to you, and to be able to critically evaluate the presentation of information across a variety of media	• discuss how information is organized and accessed • develop and use strategies for gathering, selecting, and evaluating information • pose a research question and justify the research strategy • recognize discipline-specific methodologies for conducting and reporting scholarly research • discuss legal and ethical uses of information in a scholarly context
Multiple sections of 10-20 students	One lecture section of 180 students with tutorial sections of 20 students each	One lecture section of 60 students with tutorial sections of 30 students each
1 hour class per 16 weeks	1.5 hour lecture per 12 weeks / 1 hr tutorial per 9 weeks	2 hour lecture/ 1 hour tutorial per 13 weeks

phenomenology, which includes intentional learning (see Doherty and Ketchner[15] who found a positive correlation between information literacy experiences and GPA). McGinn takes the notion of activating conscious perception and awareness when he says that the applications of the powers of consciousness "are fixed by our own introspective abilities, which is why we cannot form the concept of a bat's consciousness."[16] The explicit cognitive elements of learning are foundational to this study, and, to a considerable extent, we are examining changes in the consciousnesses of students. These works lead us to the crux of the present study. In the sections that follow we provide curricular contexts for the study and an overview of the research methods.

Overview of the Three Courses

The responses to two questions, "What is a library?" and "What is information?" came from students enrolled in one of three courses. The courses took place at the following universities: University of Missouri-Columbia (UMC), The University of Western Ontario, and the University of Toronto Mississauga (UTM). They were either first or second-year courses that were similar in purpose and intent; however, they had unique descriptions, objectives, assignments, and readings. In the table below, the course description is listed first, followed by the course outcomes, the structure of the course (lecture, tutorial, enrollment, etc.), and, finally, the duration and frequency of meetings.

Similarities and Differences among the Three Courses

A mix of Library and Information Science (LIS) Masters and PhD students supported the courses in a variety of ways: teaching sections, leading tutorials, marking. At Western, faculty members from the LIS program led the lectures. At UTM, a librarian led the lectures, and at UMC, a PhD student from the LIS program coordinated, under the supervision of an LIS faculty member, graduate students who were assigned to lead sections. With such a mixed complement, we acknowledge that there is a lot of variation in teaching methods among the three courses. Our goal, however, was not to standardize, but rather to look at change among students enrolled in similar courses, courses which focused on teaching them to think critically about information and to locate and access information.

In terms of similarities in focus, some tutorials in each course were aimed at helping students search for information using a variety of resources available through the library, such as the library catalog and subscription databases, and non-library resources, such as Wikipedia and Google. These sessions were facilitated through guided activities and the completion and submission of exercises or short assignments. The numbers of these varied within each course but were all one-hour in duration. Western provided four such sessions, UMC five, and UTM six.

Instructors in each course also spent time teaching students how to evaluate information, both within the tutorials and in lectures. Students submitted assignments to show their ability to do this. Again, we were not measuring by a standard, so we did not have a targeted level of cognitive ability that was similar across the three courses. As such, our approaches to teaching evaluation were quite different from one another. Finally, while UTM and UMC had assignments that required students to develop a research question, this was not a focus of the course at Western.

Though our emphasis in this paper is not on a thorough analysis of these differences or similarities, our preliminary results indicate that despite the variation among the courses, there were changes in each cohort. We intend to explore further the relationship between course outcomes, assignments, assessments and the changes in students' understanding of "library" and "information."

Research Methods

As mentioned, the work took place at three institutions: the University of Missouri, The University of Western Ontario, and the University of Toronto Mississauga. At all three institutions for-credit information literacy courses are offered. Data were collected in 2008 and 2009 at each university. At the beginning of each course students were asked to articulate (without prompts) their responses to the questions about libraries and information. At the end of each course students were again asked to articulate their responses to the two terms. It was explained that their responses would be anonymized and that they did not count for any kind of academic credit. They were free to refuse to participate without explanation or penalty. This method of questioning is in keeping with hermeneutic phenomenology and is designed to elicit the meaning that participants give to the phenomena under study.[17] We felt that this approach would help us to understand the perceptions of libraries

and information from students' perspectives without over determining their responses with *a priori* hypotheses. Directly asking students to articulate their understanding of libraries and information before and after the courses was designed to elicit immediate perceptions of meaning rather than, for example, asking them to reflect on how their understandings had changed over time. The analyses here examine the kinds of responses by students at the beginning and at the end of the courses.

Responses (see Table 2) were collected, transcribed into digital format, and sorted into earlier and later library or information data files. The files were then independently analyzed using qualitative coding software packages Nvivo (by a research assistant[18]) and TAMSAnalyzer (by one of the researchers). Two different analytical coding processes were used to understand the data: 1) frequency of term occurrence and 2) thematic coding through close readings of each individual response. Special attention was paid to the *differences* between beginning and concluding responses.

Findings

In this paper, we report on student responses to each question, looking at libraries and information separately, and we have focused primarily on the commonalities across the data. When looking at the entire data set, two observations are evident: there is a general shift from instrumental definitions of libraries and information to more nuanced conceptual understandings of each; and there is a clear shift from objective, third-person descriptions in the earlier responses to a reliance on personal experience as developed through the courses and through use of libraries and information resources for their academic work. In this paper we can only provide a sketch of the types of student responses that illustrate these themes for libraries and information.

Libraries

Although each course had somewhat different objectives and learning outcomes, there was a remarkable consistency in the most commonly used concepts in the earlier and later responses. The most frequently occurring concepts in the earlier responses (derived from both term occurrence and qualitative coding) included ideas of the library:

- as a place for books;
- as a neutral resource for information searching, retrieval, and use; and
- as a site that supports education and learning.

In general, there was little variation from the dominant metaphor of the library as a type of container for informational artifacts (e.g., library holdings that were described to includes books, journal articles, databases, films, music). The concept of "online resources" accessible through libraries was apparent, but more traditional notions of libraries still held sway in the earlier responses. Students also made infrequent references to people in the library whether librarians, other library staff or library users. While there were a few stereotypical comments about cranky, shushing librarians, most references were positive, extolling the expertise, knowledge and helpfulness of librarians.

In the later responses, the library as a place and source of information and books still appeared regularly, but clearly, had been mediated by the idea of a library as an essential agent in students' academic success. It was also seen as a source of differentiated, organized or classified information resources that now overwhelmingly included online databases, internet-enabled tools, and library staff. Many students expressed a new understanding of the importance for their own individual course work of the collections of their own college and university libraries, but saw what were sometimes conceived of as "community libraries" as a site of access for "the public" or "the masses." Sometimes, this was presented as a tension

Schools	Earlier Responses		Later Responses		Total
	Information	Library	Information	Library	Total
UTM	41	43	29	30	143
Missouri	158	158	93	90	499
Western	171	172	98	98	540
Total	370	374	220	221	1182

TABLE 2
Number of Earlier and Later Responses by School

between libraries and technology and was a seen as a case of *ceci tuera cela* as in the following response:

> A library is a place where information is stored and is accessible to the public. As technology advances and information becomes more accessible online, libraries will become a place to meet and serve more as a community centre (1086L).

Others struggled to articulate a more positive sense of libraries as spaces that integrated traditional and changing modes of library services. There was also a noticeable increase in the number of students who saw libraries as symbols of intellectual freedom and other democratic ideals. These themes are evident in the following two excerpts:

> "A library is a…social and information centre. It symbolizes knowledge and community within society. It houses books, computers, staff that all link people with information. It is almost like a physical, centralized internet" (1151L).

> A library is a public place of knowing. It provides books and online/in-person literary and non-literary [resources] to a specific community. Libraries are facilitated by librarians. These are valuable places of learning or community. They act as a symbol of democracy (1156L).

In general, the mystique of the library would appear to have been pierced by the time students gave their later responses. As one student wrote, "A library…is no longer a mystery but an asset. The library system is now clear and I can find information with ease (3395L).

Information
In earlier responses students relied on the ideas of information as data, knowledge, opinions, facts, as "anything" and "everything." Their later responses give some evidence of a change in their perceptions to include notions of different levels of being informed, differing degrees of information quality with frequent mention of "misinformation," needing to learn and be taught information skills, and of information as something to which value is assigned through human interpretation and use. One student succinctly

defined it as "data…which has been processed, analyzed, organized, and put into context" (1057I). Another student (below) gives a basic sense of how she has learned that the information yield is influenced by research approaches and search techniques, so while there are still "mountains of information" it is no longer an overwhelming and undifferentiated mass of data.

> My view on information has changed a great deal…This class has taught me how to obtain information through research here at the University using various tactics to obtain amount of material needed. The amount of information one can find on any type of concept is endless if using the right research tactics. I can find mountains of information…so much better after taking this class (3398I)

In the next excerpts, we can see the reliance on concepts of information as thing, as process, as "anything," but the students' definitions include more nuanced articulations of the value of information:

> Information can be found in any form, be it articles, books, television shows, newspapers, videos or anything else. It aids in forming, developing and supporting an argument or it simply educates and informs. It is in many ways a commodity that can be bought and sold but [is] deeply important to human society. There is always information but if you don't use effective methods to find it, you won't (2226I).

> [Information] can be knowledge, or a process; anything that comes to us helping to assist in our decision-making; made up of data and leads to knowledge; especially in modern society, may not always be correct, but even incorrect information educates us to find the real information and make informed choices (1179I).

Unlike in their earlier responses, many students included similar ideas that (to use the words of one student) "some information is better than other information" (2214I).

As with the later responses to libraries, some students also indicated a shift in their understanding of information to include the concept of information as

a kind of social good. However, students struggled to articulate this concept. Some saw it as an essential feature for progress as shown in the first response. The second excerpt illustrates one student's consideration of the power of information.

> I think without information our population would most likely consist of a bunch of monkeys and that would get us nowhere. So, basically, information is something our Earth requires to progress…(3359l).

> Information is not just data but the power over and interpretation of that data. It is a powerful necessity that we use everyday in our life. Information and the ability to find it and understand it, allows us to increase our overall cumulative knowledge, and also increase our quality of life. (2201l)

It is interesting to note that overall there was less variation between later and earlier responses for "What is information?" than was evident for the library data, but the change in their understanding of information also bled into later articulations of the meaning of libraries. It may be that some students were only to express their understanding of information by filtering it through experiential learning associated with libraries, namely, through the use of library resources (materials and space) and through interaction with librarians and library staff. There is ample evidence to suggest that by the time they finished the courses that they had a deeper understanding of their own roles as information users, consumers and creators.

In this paper we have just begun to illustrate what we see as shifts in the scope of students' comprehension of the dual phenomena of libraries and information. We have focused on their own articulation of the meaning and definition of each in an attempt to discern the nature of the changes in their understanding from the beginning to end of the respective courses.

Notes

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16. Max van Manen, *Researching Lived Experience: Human Science for an Action Sensitive Pedagogy* (London, ON: Althouse Press, 1990).
17. Ibid.
18. The authors would like to acknowledge Candy Yip for her coding assistance.