The Impact of Scholarly Communication on LIS Education

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Thank you for inviting me to share this day with you. I am going to put two of my interests together today in my presentation: 1) scholarly (or more narrowly scientific) communication and 2) LIS education. My perspective on both, but particularly on LIS Education, is North American so please take that into consideration when considering my remarks.

Scholarly communication, as we have heard today, is both a topic of study in LIS education and a result of research and education in our discipline. I am talking about only the former, that is: what is the role of the study of scholarly communication in LIS education in North America?

I will describe 2 main roles of scholarly communication in LIS education:

1. As an extension of our academic home and discipline (many LIS programs are now part of larger Communication and Information colleges);
2. As a methodological framework (quantitative and qualitative methods)

Finally, I will also describe some of my research relevant to scholarly communication.

As many of you know, in North America there are 56 programs of LIS education accredited by the American Library Association. Accreditation is only for the master's degree program. Thirty years ago almost all of the 56 were stand-alone programs—that is they were not part of a larger academic unit or college—or part of faculties of humanities or education.

Today a number of programs, such as the University of Tennessee, are part of a broader College of Communications. For our part, in 2003 the independent School of Information Sciences became part of a new College that brought together the old College of Communications with the School of Information Sciences and department of Speech

Communication from the college of Arts and Sciences. We formed the new College of Communication and Information, with 4 schools: The School of Information Sciences, The School of Journalism and Electronic Media, the School of Communication Studies, and the School of Advertising and Public Relations.

This is very similar to the structure at Kent State, Rutgers University, University of South Carolina, and others.

One of the things that all of these divisions have in common is Scholarly Communication. In our journalism program at Tennessee, for example, there is a specialty in science communication, public relations experts are interested in how science organizations get their message out, Communication studies is interested in the broader issues of conveying meaning.

There is a difference in the perspective of scholarly communication in all of these academic disciplines, however. If you look at one model for scholarly communication, commonly called the oil spot model, it may help to illustrate that difference by seeing where in the model each of us fit (William L. Renfro, Chapter 5: "Key Stages of The Issues Management Process," pp. 67-92, in: Issues Management in Strategic Planning. Westport, CT: Quorum Books, 1993.) Science begins in the center with research and scientists talking to other scientists. Over time it is disseminated outwards to larger and larger audiences and is diluted at the same time as it must be interpreted and explained to more general audiences.

Scholarly communication studies in LIS are typically focused near the center of the model—that is how scholars communicate with each other through both formal and informal means. Journalism is typically at the outer edges; communicating science through newspapers or newsmagazines to lay people.

Another model I use in my research is adapted from the Garvey and Griffith studies of the 1960s (Tenopir & King, Towards Electronic Journals, Special Libraries Association, 2000.) It shows the range of scholarly communication interests in LIS as well—scholars discuss their work with each other and then, as both readers and authors, use a variety of more formal communication means. For those, like me, who focus more on publications, we look at how scientists as authors and readers, publishers, libraries, and others interact to make this entire system work.

The scholarly communication process and where LIS fits in can also be depicted as the formal scholarly publishing cycle or information life cycle, where all aspects of

information creation, dissemination, use and preservation are part of the LIS sphere of interest. The specific application that I am interested in is the journal article, but the life cycle works for many examples and applications of the communication and information process.

The LIS viewpoint typically comes from focusing on the scholars and the sources that scholars need to communicate. We tend to look at them somewhat as authors, but more often as readers or how do we help scholars get to the sources they need to use. This is different from the viewpoint of others of our communication colleagues. Speech communication generally focuses on informal, interpersonal, or organizational forms of communication, still on the scholars themselves, but scholars as oral communicators and listeners. This is in the very inner part of the oil spot dissemination model. In Journalism, mass communications, and public relations, their viewpoint of scholarly communication is not on how scholars communicate to each other or how they understand scholarly communications of their colleagues, but on how scholars communicate their information to a wider audience, typically the general public. They deal with the far outer edges of the oil spot model.

Taken all together from all perspectives, the Fields of Communication and Information cover issues in this entire model or in all phases of the information life cycle.

Most of our theories in scholarly communication and information science we share with communication—including diffusion of innovations, sense making, and grounded theory, etc. From both a theory and practice viewpoint scholarly communication is having a continuing and growing influence on LIS education. An interdisciplinary model has much to offer all communication and information fields.

Here are some titles of courses in LIS programs that reflect the role of scholarly communication (and this does not include titles of research projects, which are influenced even more):

- Scientific and Technical Communications
- Computer Mediated Communication
- Computer supported collaborative work
- Human Information Interactions
- Biodiversity Informatics

- Information Policy

Switching to methods, scholarly communication has influenced both quantitative and qualitative LIS research methods. Most obvious and widespread are the quantitative methods relating to bibliometrics. Since bibliometrics was discussed earlier in depth, I will not say much more about it other than to say it is an accepted and entrenched research methodology in LIS education that is all about scholars as communicators, particularly as measured through the literature they cite in their scholarship.

Instead, I want to share with you some of my research that examines how scholars communicate using formal information sources and, in particular, the form of scholarly articles or scholarly journals.

From a methodological standpoint, there are 5 main methods typically used in LIS research to study scholarly communication patterns or the broader topics of users and usage:

- Usage transaction logs (from vendors or homegrown)
- Surveys (questionnaires or interviews)
- Observations and other experiments
- Focus groups
- Bibliometrics (citing and authoring patterns)

Depending on the method you choose, you can answer different questions or reach different types of conclusions about users.

- For example, usage logs from electronic collections is good for telling libraries or publishers about overall amounts of logins and downloads from specific online systems or sources. They show information from all users.
- Interviews or surveys can collect user opinions about what they like and don't like about information sources or services, can gather information on how much people say they use both print and electronic collections, and can answer questions such as why one resource is chosen over another, and what a user did with the information (or the outcomes of reading).
- Experiments can show what a small number of users do on a specific online system or for a specific problem in either a controlled experimental setting in a laboratory

or in a natural setting. Questions can be answered about why they are doing something and if they are satisfied with the results.

- Focus groups can show what a small number of users say they like and dislike about the collections, services, and sources and what they would like to have or do in the future
- Citation studies show what scholars actually use in their work or use enough to tell others that they have used this source.

For studies of scholarly communication I mostly use surveys because:

- Usage Logs don't show why someone used or requested a source or the outcomes on their work from using that source.
- Requests or downloads may not be equal to use or satisfaction—someone may download an article and find it worthless for their task or they may be unhappy because they didn't find what they wanted and go somewhere else.
- Log sessions may be difficult to differentiate or compare across systems.
- For privacy or other technical reasons, logs typically do not show behavior by demographic groups. For journal articles you should expect that medical journals will get about 2 to 3 times the amount of use of humanities journals, because medical faculty read more articles than other groups. That does not mean that the value of the readings by humanities scholars is any less, just because the readings are less. You must take into account the relative size of your subject departments and the expected reading amounts by department.
- Finally, usage logs show only a fraction of total use of scholarly materials. They tell nothing about the use of print journals, readings from personal subscriptions, or readings from the free web.

To measure different types of reading behavior, our surveys include several types of questions:

- Demographic (things tested for influence on behaviors, such as age, academic discipline or department, rank, etc. In Australia we asked students how far from campus they lived.)
- Recollection of behaviors (how often something is done). We usually try to not ask too many questions that rely on someone's memory of what they did in the past. If

you ask someone how often they used the library in the last 5 years, the results won't be too reliable. We ask for a shorter period—how much in the last month, for example, or give choices such as daily, several times a week, etc.

- Opinions (reactions to statements on a scale, valuing services on a scale). If you want to know what people really think about a service you have or are planning to have, you must ask for their opinion. The best types of opinion questions give a scale, for example, 1 to 5 with 5 being outstanding and 1 being terrible. Or 5 being this service is extremely important to me and 1 being this is unimportant.
- And finally, in my surveys I use a variation of the critical Incident technique or instance of last reading. We can then ask questions on outcomes and value of this specific event. Let me give you some examples of each of these from my work with surveys of reading and scholarly communication.

Using the demographic question of subject discipline plus a recollection question—how many articles did you read in the last month (4 weeks): we can make conclusions like this: university medical faculty and university science faculty read twice as many articles as do university humanities faculty.

To make surveys more useful, we ask the same types of questions every few years, so we can look at trends or measure the impact of changes in the environment; adding longitudinal data allows us to get a picture of trends over time. And, adding critical incident questions such as details of the last incident of reading or of library use, we get a more detailed picture of user behavior.

For example, if I take the recollection of amount of reading and just for university faculty and look at it over time, we see clearly that the amount of reading is going up. Scholars are reading more each year. (This is true of all groups we've studied.)

As I mentioned, the research I am reporting to you today also uses critical incident—asking respondents to tell about the last reading they did. The Last reading is equal to taking a random sample of readings—so our population is all readings done by the user group.

We ask how long they spent reading this last article and have found that over time the average time spent reading per article has gone down, especially in the last ten years. The average amount of time is now just over thirty minutes per article, down from an average of 48 minutes in 1977. Scholars must read more and are reading more, but they only have

so many hours in the day, so they need to read very quickly.

This also varies considerably by subject discipline, with medical faculty reading much more quickly on average than others and engineers spending the most time per article. These types of findings have implications for libraries, for publishers, and for anyone interested in designing better products and services for scholars.

We also ask the source of the last article read. Both faculty and students find articles from a variety of sources, personal subscriptions, library collections, and other sources such as the free web or from colleagues. At one university we studied, both groups use library collections, but 75% of all readings by doctoral students come from library-provided subscriptions (and only 42% of all faculty readings) and faculty rely on readings from personal subscriptions at a much higher rate than students.

Purpose and motivation are also important to know the value of reading. We ask participants for what purpose they read the last article they read. Across all faculty departments, the most common reason for reading articles is for primary research, followed by current awareness.

But value doesn't necessarily just equal frequency of use. Medical faculty read most often for research and second most for current awareness.

When we asked the same respondents to tell us how valuable the last reading was to them, we can rank value to purpose. Although reading for consulting and treatment accounted for only 4% of the total amount of readings, these readings were rated most valuable. Reading for research is second most valuable. Although I don't show it here, readings for research and writing are more likely to come from library-provided materials, demonstrating the high value of the library collections.

We also ask about the age of the last article read. Today about one-half of the average faculty member's readings are from the current year, with the other half two years or older. Students read a higher percentage of older articles. For both, older articles are more likely to be for research, are more likely to be from libraries, and are rated as more valuable.

Of course, as with any method, surveys have some limitations because:

- All surveys rely on truthfulness (we expect respondents will tell us the truth)
- Surveys also rely on the accuracy of people's memory, and
- Response rates are falling, particularly with online surveys. We usually get only a 10-35% response rate these days.

My research clearly falls in the middle of the oil spot model of scholarly communication. I am interested in how scholars communicate with each other and how formal channels of scholarly research information are used by and created by the scholars themselves.

In LIS education this type of work flows throughout the curriculum, so let me return to the information life cycle. The information life cycle might be called the scholarly communication cycle as well. At UT we build our LIS curriculum around the information life cycle. It can also be used to explain how Scholarly Communication and LIS education fit together to others in our college and beyond. Whatever model you prefer—oil spot, life cycle, Shannon and Weaver, or Garvey and Griffith—scholarly communication and LIS education clearly have a close relationship that pervades curricula and research.