Listening to Students: A User-Centered Assessment of Incoming Graduate Students' Research Skills

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Introduction

The academic library serves a diverse population of users, from incoming freshmen to graduate students completing dissertations, to faculty creating and disseminating knowledge within their disciplines. As academic librarians, we strive to assist with the research process at every level. The genesis of this research project was the authors' desire to create evidence-based library programming for graduate students. The authors identified few articles in the professional literature that focus on the library research needs of incoming graduate students. This is a population that is often overlooked in library instructional programming, much of which focuses on teaching research skills to the undergraduate. Providing an appropriate level of library instruction and support for new graduate students should be based upon data that identifies incoming strengths and deficiencies. This paper presents the results of a pilot project designed to gather information on how incoming graduate students in the social sciences at the University of Kansas (KU) conceptualize and implement the research process at the start of their graduate careers.

Literature Review

The selected articles discuss current research on the information seeking skills of graduate students and the delivery of library services to this user group. Blum-mer (2009) provided an historical overview (from the late 1950s to 2009) of library instructional programs that focus on graduate students. The author concluded that much of the programming directed to this user population focused less on the acquisition of research skills and more on teaching about the organization of information. George and Bright, et al. (2006) investigated the information seeking behaviors of graduate students who were enrolled in six disciplinary areas at Carnegie Mellon University. The authors drew implications for library services and offered suggestions for responding to the information needs of graduate students. Washington-Hoagland and Clougherty (2002) reported the results of a University of Iowa Libraries needs assessment survey that was administered to a random sample of graduate and professional students. The survey sought to identify how graduate and professional students use the Libraries' resources and to determine unmet user needs. The authors described short-term and long-term goals that were implemented as a result of the survey responses.

Remple and Davidson (2008) discussed the development of library programming for graduate students at Oregon State University. This library programming focused on offering literature review workshops across disciplines. The authors presented various topics covered in the workshops and noted that opportunities for the graduate students to meet in small

groups to discuss their various research processes and strategies were quite valuable. Hoffmann and Antwi-Nsiah et al., (2008) conducted interviews and focus groups with graduate students (and faculty who supervised or taught graduate students) at the University of Western Ontario in order to develop a general instruction program directed at the particular needs of graduate students. The resulting program consists of a variety of research skills workshops that are also available as online tutorials.

Green (2010) studied the literature review process of American and Australian doctoral candidates and advisors and academic librarians. The study indicated that doctoral students typically develop information literacy through the process of their scholarly endeavors. The author suggested that academic librarians should examine assumptions of information illiteracy when working with this user group. Fleming-May and Yuro (2009) queried doctoral students in focus groups regarding their information needs. Based upon conversations within the focus group discussion, the authors suggested a variety of ways in which academic librarians can engage with doctoral students. Additionally, the authors encouraged academic librarians to create "point-of-need" opportunities for engaging students, and advocated that an understanding of the entirety of the dissertation process would help academic librarians in their service delivery.

Methodology

The authors of this study are two subject specialist librarians at the University of Kansas Libraries who have liaison responsibilities to academic departments within the social sciences. In July 2009, the authors applied for and received funding from the University of Kansas Office of Research and Graduate Studies, New Faculty General Research Fund (NFGRF), in order to conduct interviews and study the research competencies of first year graduate students in select departments within the social sciences (political science, sociology, psychology, and anthropology). The NFGRF funding supported the transcription of the interviews and provided financial incentives for participation in the interviews. The authors also applied for and received approval to conduct the research from the University of Kansas Human Subjects Committee, the Institutional Review Board for the University.

The participants for the project were first year graduate students in the departments noted above

who had no previous graduate work. This specific population was selected, in part, because the authors are social sciences librarians and are therefore more familiar with the research needs of social scientists. The authors solicited participation in the project via fliers and e-mail requests to departmental graduate student advisors and secretaries. All students who responded and met the criterion of no previous graduate work were interviewed (N = 15).

Both the research design and the interview instrument were developed in consultation with academic researchers and faculty within the social sciences. The interview instrument consisted of 21 open-ended questions (see Appendix A). A practice interview was conducted with a graduate student who was employed by the KU Libraries. The interviews were held in the Libraries and both authors were present for the majority of the interviews. Interviews typically lasted between 30–45 minutes. Each interview was audio taped and subsequently transcribed. The privacy of the participants has been protected.

Using Atlas-ti qualitative analysis software, the interviews were coded according to the Information Literacy Competency Standards of the Association of College and Research Libraries (ACRL) (2000). A priori codes (pre-existing concepts) were developed from Standards One–Four. The authors coded the standards and objectives from each interview together, using the examples of competencies to identify the correlating actions. Additionally, free-codes were developed during the coding phase for emerging themes.

Results

The following results are descriptive, providing an insight into 15 graduate students' research processes and skills, i.e., how they describe and implement the research process. The goal of the project was twofold: to learn about their skills in comparison to the ACRL Information Literacy Competency Standards, and to develop a fuller understanding of how students carry out the research process. The resulting emergent themes not only have implications for further research, but they have also led the authors to reconsider traditional methods of library instruction for this user group. The results section describes the authors' observations, specifically whether the students met the ACRL Standards. The section also discusses trends identified during the coding process, including

the authors' assumptions related to student information illiteracy, faculty involvement, library/librarian assistance, and academic socialization.

Fulfillment of ACRL Information Literacy Competency Standards for Higher Education

As part of the data analysis process, the authors evaluated each student on the fulfillment on each of ACRL Standard's performance indicators after the initial coding. The process was subjective because of researcher bias and inconsistency in students' descriptions of their processes or skills. However, the outcomes provided a significant guide to understanding the students' skills, enabling the authors to develop a general idea of the information competencies of these students. The results indicated that the majority of the students fulfilled outcomes as outlined by the ACRL Standards.

TABLE 1
Breakdown by Study Participant Major

Major	Number of Students
Sociology	4
Psychology	4
Anthropology	3
Political Science	4

TABLE 2
Students' Fulfillment of Standards

Standard	Average Score
Standard 1 (16 outcomes)	90.6%
Standard 2 (16 outcomes)	72%
Standard 3 (25 outcomes)	80%
Standard 4 (10 outcomes)	65%

Standard 1: The Information literate student determines the nature and extent of the information needed.

Standard 1 represents the area in which students demonstrated the greatest strength. All 15 students demonstrated skills in the following four outcomes:

1. Develops a thesis statement and formulates questions based on the information need
2. Defines or modifies the information need to achieve a manageable focus
3. Recognizes that existing information can be combined with original thought, experimentation, and/or analysis to produce new information

4. Identifies the value and differences of potential resources in a variety of formats (e.g., multimedia, database, website, data set, audio/visual, book)

The major area of weakness identified for Standard 1 was:

1. Considers the feasibility of acquiring a new language or skill (e.g., foreign or discipline-based) in order to gather needed information and to understand its context (5 out of 15)

Standard 2: The information literate student accesses needed information effectively and efficiently.

None of the 22 outcomes in Standard 2 was met by all students. However, 13 students met the following nine outcomes:

1. Implements the search using investigative protocols appropriate to the discipline
2. Uses various search systems to retrieve information in a variety of formats
3. Uses various classification schemes and other systems (e.g., call number systems or indexes) to locate information resources within the library or to identify specific sites for physical exploration
4. Differentiates between the types of sources cited and understands the elements and correct syntax of a citation for a wide range of resources
5. Identifies keywords, synonyms and related terms for the information needed
6. Assesses the quantity, quality, and relevance of the search results to determine whether alternative information retrieval systems or investigative methods should be utilized
7. Identifies gaps in the information retrieved and determines if the search strategy should be revised
8. Repeats the search using the revised strategy as necessary
9. Records all pertinent citation information for future reference

The main areas of weakness identified in Standard 2 were:

1. Selects controlled vocabulary specific to the discipline or information retrieval source (2 out of 15)
2. Selects among various technologies the most

appropriate one for the task of extracting the needed information (e.g., copy/paste software functions, photocopier, scanner, audio/visual equipment, or exploratory instruments) (2 out 15)

Standard 3: The information literate student evaluates information and its sources critically and incorporates selected information into his or her knowledge base and value system.

Out of the 25 outcomes in Standard 3, all 15 students demonstrated the skills in the following eight outcomes:

1. Reads the text and selects main ideas
2. Restates textual concepts in his/her own words and selects data accurately
3. Determines whether information satisfies the research or other information need
4. Draws conclusions based upon information gathered
5. Integrates new information with previous information or knowledge
6. Selects information that provides evidence for the topic
7. Determines if original information need has been satisfied or if additional information is needed
8. Reviews information retrieval sources used and expands to include others as needed

The major area of weakness in Standard 3 was:

1. Participates in class-sponsored electronic communication forums designed to encourage discourse on the topic (e.g., email, bulletin boards, chat rooms) (0 out of 15)

Standard 4: The information literate student, individually or as a member of a group, uses information effectively to accomplish a specific purpose.

All 15 students' demonstrated skills in the following three outcomes linked to Standard 4:

1. Integrates the new and prior information, including quotations and paraphrasing, in a manner that supports the purposes of the product or performance
2. Chooses a communication medium and format that best supports the purposes of the product or performance and the intended audience

3. Communicates clearly and with a style that supports the purposes of the intended audience

The major areas of weakness associated with Standard 4 were:

1. Maintains a journal or log of activities related to the information seeking, evaluating, and communicating process (1 out of 15)

This outcome is not necessarily indicative of lack of information seeking skills among students, but reinforces the authors' observations of the students' lack of awareness of their own research processes.

2. Incorporates principles of design and communication (1 out of 15)

Trends Identified during Coding Process
Authors' Assumptions of Student Information Illiteracy

One of the most significant conclusions that emerged as a result of this project was the realization of the authors' own biases toward the information illiteracy of students. During the inception, planning, and interview phases, the authors assumed that all of the students interviewed would lack key information literacy skills and knowledge. This may be common among academic librarians, as Green notes, "[academic librarians] seemed predisposed toward the view of doctoral candidates as information illiterate or lacking information skills "(2010, 314). The authors, immediately following several interviews, informally noted that subjects seemed to lack basic information literacy skills. However, during the data analysis phase, when the authors closely coded the transcribed interviews to the ACRL Standards, it became clear that the majority of students possessed high levels of information literacy, even those initially observed as possessing weak information literacy skills. By more carefully reading the students' descriptions of their research processes and coding by the performance indicators that the students demonstrated, the authors' perceptions began to change. In general, the authors observed that these 15 students have genuine intellectual curiosity. While they may need assistance refining their skills, they have strong foundations of research skills for their graduate work. As a result, the authors began identifying what the students **do** know. The following student statement is representative of several students' thoughts about graduate school:

I think you have to take a lot more initiative, I would imagine, and what I mentioned about having fewer guidelines probably applies. I would imagine you have to choose your own research. I mean you really have to know what you're interested in to start with or you're not going to get anywhere, I would imagine. It seems like there's a lot more focus on analytical thinking and critical thinking rather than simply regurgitating someone else's argument and being original too. That's the point I guess (Interview 12, 75).

Faculty Involvement

The important role of teaching faculty in delivering information literacy guidance emerged as a dominant finding in this research. A number of the students discussed faculty mentoring and guidance during the research process. One of the most significant and applicable findings was that the faculty were often the source of information regarding library research, directing students to appropriate databases and suggesting other information sources. This was particularly interesting in light of the findings regarding librarian involvement, which is discussed below. The authors discovered that students learn, or at least remember, specific resources suggested by their faculty rather than by librarians. The students who named specific databases were more likely to have learned about these from their faculty. This reinforces the important role of faculty in teaching not just about subject content and the research process, but also identifying appropriate library resources. One student stated:

As undergrad, I don't know, I didn't know what Psych Info was until my last semester as a senior as an undergrad. But only because I was working on my own research project with a faculty member (Interview 2, 16).

Another student described learning about library resources from faculty:

As well as faculty advice. They were usually very helpful of pointing me in books and even giving me their own books and saying, you know, look at this and bring it back and get what you need out of it. So there was faculty. It was the library as well, and then elec-

tronically it was the library resources, J-Stor and EBSCO and then obviously the New York Times archives (Interview 14, 62).

Librarian/Library Assistance

One surprising finding in analyzing the results was the fact that students seemed not to consider librarian assistance during the research process. None of the students had attended a library a session related to the specific research paper that they were describing. Ten students had at least one library session during their undergraduate careers, but these were often described as moderately helpful. The content of these sessions was described mainly as tours and general instruction regarding searching library resources, such as databases.

Conversely, one student discussed the problem with having too many library sessions as an undergraduate:

I have had one, two, three, four. Four or five and I really think that one was more than enough because they would bring us in, and I mean it's very important to know how to use the library, to know how to use the resources that are available to you. And not to offend anyone, it is an important time in the sun for librarians because they are so unappreciated in academia that, whenever they're given an opportunity to—this has been my experience—to speak, to give the incredible training that they usually have had to do their jobs, they get very excited. And sometimes encourage professors to do it lots of times and once was very informative. The second time cleared up some questions that I had. Three and four made me again want to toss myself out the nearest window (Interview 4, 83).

In addition to the few library instruction sessions requested by faculty and attended by students, only a small percentage of students (13%) individually requested assistance from librarians. While all of the students had used library resources to some extent, very few requested research assistance specifically from librarians. Again, they turned mainly to their faculty, not librarians. When librarians were consulted, it was usually for services such as interlibrary loan.

Academic Socialization

The graduate students who were interviewed appeared to develop a strong understanding of the way that information is used and created in academia, which the authors describe as "academic socialization." The authors observed that several of the students demonstrated an awareness of how the academic world functions: how research is conducted and disseminated, and the requisite publishing and presenting scholarly information throughout their academic careers. Awareness of the full dimension of academic research, especially for those pursuing careers in academia, is significant because this could impact their approach to the entire research process as graduate students and their future professional careers.

One student described the need for collaborating with faculty members to advance his research agenda (Interview 2, 174). However, he struggled with such collaboration and tried to balance his own theories and the faculty member's theories. The academic librarian needs to be aware of this, and similar challenges, because they influence the research process of the student, whether the students are aware of this or not. An anthropology student demonstrated her awareness of the dynamics of research in academia as she approached her undergraduate project from a long-term perspective. The student said:

> I think I was really anxious the whole time, wondering like is this going to be an original contribution to ecological knowledge or am I just redoing something that I just haven't happened to read yet? And so that made me really nervous because the whole time I was writing it I was like I would really like to get this published but I don't know if it's good enough (Interview, 7, 72).

Implications

The ACRL Standards were a useful tool for the data analysis because they guided the authors in looking for specific skills possessed by the students. For undergraduate student library instruction, the goal is often to teach the individual research skills that are necessary to attain a functional level of information literacy. For graduate students, the Standards provide a starting point for a stronger focus on teaching about the research process itself, since our research indicates that graduate students already possess considerable information literacy skills. The authors hope that the results of this investigation will challenge the thinking of academic librarians who teach information literacy skills to incoming graduate students. Early results suggest that these widely-used Standards may be more useful for undergraduate instruction and that information literacy instruction for graduate students could focus more on the research process itself.

After talking with and listening to these students, the authors are considering new approaches to working with this distinct user population. The authors gained significant insights from talking with the students in an interview setting, and now believe continuing conversations with students would be mutually beneficial. Several of the students commented that participating in the interview helped them reflect on and understand their own research process because it was the first time that they had consciously considered and articulated their own methods. A strong understanding of their own individual research process will be necessary as they progress through graduate school. One student said "It's actually been good to kind of think about it because I've thought more about research projects. It's kind of timely at this point for me, so it's good" (Interview 14, 104).

The authors benefited from talking with the students because of the knowledge gained about students' individual skills and also about how they approach the research process. This method of interacting with these emerging scholars contributes to the overall academic socialization of these students. Librarians participate in the academic socialization process by helping students to understand the life cycle of scholarly information and the students' role in this process.

After interviewing the students, the authors discussed a modified technique of working with these students that would shift from traditional library sessions or orientations to a facilitated discussion group for new graduate students. Each discussion group would consist of a cohort of new students from the same department in an informal setting and simply exchanging ideas about their research processes. A series of discussions over the course of their first semester could also be added, and could include inviting the experienced graduate students and faculty members to discuss differences in graduate school research expectations. These discussions could also help alleviate anxiety for the new students and assist with strengthening the cohort relationship.

The discussion group approach could have several benefits for the librarians, including establishing a rapport and relationships with the students, helping them understand their research process at the beginning of their academic careers, and creating a dynamic between student and librarian that is similar to the students' collaborative relationships with faculty. If this type of collaborative relationship can be established, librarians will become primary resources in the minds of graduate students. Listening and discussing may prove more useful than lecturing to students what we think they need to or should know. Librarians have the expertise and opportunity to help students refine their processes and strengthen their skills using the student's own skill base as a starting point. As Green states,

> Thus, drawing attention to doctoral candidates' strategies for engaging with information and literature encourages another view of students' prior knowledge, their experience, and the effect of information attributes that these learners bring with them (2010, 318).

Working with students' strengths, letting go of librarian information illiteracy bias, is a possible way to be more effective and helpful librarians.

Future Considerations for Research and Programming

More research is necessary to build upon the findings presented in this paper. One area for further study is to create or to develop a survey to identify faculty expectations of the research skills of incoming graduate students, potentially identifying a "disconnect" between what faculty expect and what the students actually understand about the research process and information literacy. The results of such a survey could be used to inform library instruction programs for new graduate students, as well as to initiate more faculty/librarian collaboration. The authors would like to expand the interview process into a longitudinal study, in which students would be interviewed annually to track their progress through graduate school in order to identify how they become more proficient as academic researchers. From the discussion groups previously discussed, the findings may provide direction for further research. Another interesting area for additional research is

a study to determine whether the research skills of students who intend to pursue graduate degrees differ from those of undergraduates who do not intend to go on in academia. Expanding research that establishes evidence-based programming will ultimately lead to better services to all distinct library user populations.

References

Association of College and Research Libraries. 2000. Information Literacy Competency Standards for Higher Education. *American Library Association*.

Blummer, B. 2009. Providing Library Instruction to Graduate Students: A Review of the Literature. *Public Services Quarterly* 5 (1):15–39.

Fleming-May, R, and L Yuro. 2009. From Student to Scholar: The Academic Library and Social Sciences PhD Students' Transformation. *portal: Libraries and the Academy* 9 (2):199–221.

George, C, A Bright, T Hurlbert, EC Linke, G St Clair, and J Stein. 2006. Scholarly Use of Information: Graduate Students' Information Seeking Behaviour. *Information Research* 11 (4):11–4.

Green, Rosemary 2010. Information Illiteracy: Examining our Assumptions. *The Journal of Academic Librarianship* 36 (4):313–319.

Hoffmann, Kristin, Fred Antwi-Nsiah, Vivian Feng, and Meagan Stanley. 2008. Library Research Skills: A Needs Assessment for Graduate Student Workshops. *Issues in Science & Technology Librarianship no* 53 (Winter/Spring 2008).

Rempel, Hannah Gascho, and Jeanne Davidson. 2008. Providing Information Literacy Instruction to Graduate Students through Literature Review. *Issues in Science & Technology Librarianship no* 53 (Winter/Spring 2008).

Washington-Hoagland, C, and L Clougherty. 2002. Identifying the Resource and Service Needs of Graduate and Professional Students: The University of Iowa User Needs of Graduate Professional Series. *portal: Libraries and the Academy* 2 (1):125–43.

Appendix A:
Interview Instrument

Monroe/Petr

1. What is your department?
2. What was your undergraduate degree in?
3. How long ago did you receive your degree?
4. Describe a recent research paper you wrote.
    a. What was the assignment?
    b. What were the requirements of the paper?
        i. Amount of guidance from the instructor?
5. What kinds of resources did you need to find (scholarly, statistics, etc.)
    a. How did you determine this
6. How did you start?
    a. Why did you choose to start that way?
    b. What was your next step?
7. Did you use an outline?
8. Did you begin with a defined research question? If not, how did you define the question?
9. Where do you go (electronically or physically) to collect information?
    a. How did you choose the sources?
    b. How did you decide whether a source was useful? Appropriate?
    c. Why did you choose that source over another one?
    d. Did availability affect your decision to use a source?
    e. Was it important to find only full-text articles?
10. Did you search for information on the Web?
11. Did you use a Library's resources in your search?
12. How did you know when you were done with the research?
13. How much time did you have to complete the paper? Did that influence your approach to collecting information?
14. Did you ask for assistance? Discuss the project with anyone?
    a. From whom? How did you decide who to ask?
    b. What kind of assistance did you request?
15. Anything especially challenging with the assignment? Did anything make you nervous or anxious during the research?
16. Did you find the assignment personally interesting? Why or why not? (did you get to choose the topic or was it assigned?)
17. Where did you do your work?
    a. Did you use a laptop or a desktop?
18. How do you think graduate work differs from undergraduate work?
19. Have you ever had a library session in your academic career?
20. Did you receive library instruction for the paper you described?
    a. If you have had a library session, how has it prepared you for graduate school?
21. Do you have any final thoughts or comments about the research process you would like to add?