Mentoring, collaboration, and interdisciplinarity: An evaluation of the scholarly development of Information and Library Science doctoral students

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Introduction

The goal of this study is to evaluate the development of scholars within the field of information and library science with an emphasis on mentoring, collaboration, and interdisciplinarity in the process of doctoral education. The doctoral process is deeply situated within the current disciplinary framework—students receive degrees in specific disciplines and are trained to work within the same disciplinary affiliation at other institutions (Turner, 2000). However, there is considerable debate over the actual definition of a discipline. One definition calls disciplines ways in which to “describe and differentiate knowledge, institutional structures, researchers, and resources in the working world of scholarship and science” (Palmer & Cragin, 2008, p. 172).

Becher (1989) and Turner (2000) focus on the disciplinary identity created by organizational structure and content area, but Becher (1989) cites Price’s admonition that: “we cannot and should not artificially separate the matter of substantive content from that of social behavior” (as cited in Becher, 1989, p. 20).

Numerous constructs have been explored with an emphasis on the social behaviors of disciplines, including the concept of invisible colleges (Price & Beaver, 1966), academic tribes (Becher, 1989), communities of practices (Lave & Wenger, 1991), paradigms (Kuhn, 1996), discourse communities (Hyland, 2004), and epistemic cultures (Knorr Cetina, 2007). A common theme across these constructs is that disciplines are intellectual spaces characterized by certain norms and accepted behaviors—especially in terms of what can be studied within the domain and how that information can be communicated. This act of communicating is paramount for many definitions of disciplinarity. Hyland (2004) states the importance of the act of academic writing in particular by stating: “writing, therefore, is not simply marginal to disciplines, merely an epiphenomenon on the boundaries of academic practice…[o]n the contrary, it helps to create
those disciplines by influencing how members relate to one another, and by determining who will be regarded as members, who will gain success and what will count as knowledge” (p. 5). This sentiment is echoed by Montgomery who noted: “There are no boundaries, no walls, between the doing of science and the communication of it; communicating is the doing of science” (as cited in Cronin, 2005, p. 7). It is therefore perhaps not unexpected that the formal texts produced by this communication are often the unit of analysis when exploring disciplinary structures and practices.

One element that is often overlooked is the context in which scholars learn the communicative behaviors of their discipline. One potential context is the doctoral education process and, in particular, the relationship between a doctoral student and their advisor. Faculty advisors have been called the “gate keepers to the scholarly profession” and the “socializing agents of the discipline” (Girves & Wemmerus, 1988, p. 171). This relationship, cited as the most critical element in doctoral education (Heinrich, 1991, 1995; Heiss, 1970; Zhao, Golde, & McCormick, 2007), begs further investigation in the way in which it is used to impart the communicative norms and expectations of the discipline.

Two particular communicative practices will be investigated here: collaboration and interdisciplinarity. Collaboration between advisors and students is seen as a vital aspect of mentoring (Busch, 1985; Cameron & Blackburn, 1981; Jacobi, 1991; Lipschutz, 1993) that “can directly aid the new doctoral student’s productivity, success, and competence” (Green & Bauer, 1995, p. 542) and serve as one of the most powerful learning experiences for doctoral students (Ashford, 1996). This form of mentoring may be especially important in those fields such as ILS where collaborative research is becoming more prevalent.
Interdisciplinarity has been called “the watchword of our times…a ‘mantra’ of contemporary science policy…and an ‘imperative’” (Feller, 2006, p. 5) of current scientific endeavors. Interdisciplinarity has been heavily promoted by funding agencies and academic institutions (Bordons et al., 1999; Haythornthwaite, 2006; Porter et al., 2007) and studies show an increasing level of interdisciplinarity across many areas of research (e.g., Morillo, Bordons, & Gómez, 2003). However, despite the growing prominence of interdisciplinarity in funding initiatives and research studies, “there is no agreed upon definition of interdisciplinary research, nor are there widely recognized, valid, and reliable measures of [interdisciplinary] activity or output” (Porter, Roessner, & Heberger, 2008). It is therefore necessary to provide indices for measuring interdisciplinarity and investigate how interdisciplinary behavior is incorporated into doctoral education.

This proposal attempts to address these issues, with a particular focus on the following sets of questions: 1) What are the mentoring behaviors and practices of ILS faculty? How is information exchanged between these individuals? 2) What is the extent of collaboration between ILS advisors/advisees? To what extent can the dissertation itself be considered a collaborative product? 3) What are the interdisciplinary influences on the ILS dissertation process? To what degree do ILS doctoral students engage in interdisciplinary behaviors?

**Methods**

The following section will describe the population of the study and the four methods used to collect data—namely, electronic questionnaires, semi-structured interviews, content analysis of the curriculum vitae, and bibliometric analysis of the dissertation bibliographies. These four methods will be triangulated in order to provide a broad lens on the presence of mentoring, collaboration, and interdisciplinarity in the doctoral process.
Population. Two sub-populations were solicited for participation in this study, roughly named the “advisors” and the “advisees.” The advisors were defined as those tenured professors (at the rank of associate or full) at the 32 doctoral-degree-granting ALA-accredited institutions in the United States and Canada. These individuals were chosen for their high potential to serve as dissertation advisors. The advisees were comprised of all assistant faculty members at any of the 56 ALA-accredited schools in the United States and Canada. These individuals were chosen as faculty members most recently in the doctoral process and able to provide accurate reflections on the process.

A list of potential faculty members was gathered from the academic directory found at [http://www.slis.indiana.edu/faculty/meho/LIS-Directory/](http://www.slis.indiana.edu/faculty/meho/LIS-Directory/) and by individual searching of each school’s webpage. The list was refined by limiting to full-time faculty members and excluding members of this dissertation committee. Through this process, 648 faculty members were identified for the study, consisting of 294 advisees and 354 advisors.

Questionnaires. Two electronic questionnaires were created using Qualtrics and were distributed via a link embedded in individual emails to all 294 advisees and 354 advisors. The questionnaires were opened on January 29, 2009 and were closed on March 4, 2009 (having been open to both groups for at least four weeks). A total of 93 completed questionnaires were received for the advisee group, for a return rate of about 32%. Six additional partial questionnaires were completed by the advisees. A total of 107 completed questionnaires were received for the advisor group, for a return rate of about 30%. An additional 33 partial questionnaires were also collected. The quantitative data was exported from Qualtrics into SPSS for statistical analysis. The open-ended questions were exported into NVivo for qualitative coding.
The questionnaires were constructed using Kram’s (1983) mentoring model, which classifies mentoring into two classes—psychosocial and career—and describes the four phases of a mentoring relationship as a progression through initiation, cultivation, separation and redefinition. The questionnaires sought to elicit information on the prevalence of mentoring in the doctoral student/advisor relationship and to describe this relationship in the context of Kram’s (1983) model. In addition, the questionnaires ascertained the degree of collaboration in both the product of the dissertation and in the doctoral process. Interdisciplinarity was assessed in terms of the discipline in which the participant received their doctoral degree and, in the case of the advisees, the methodology used in their dissertation, the classification into which they would assign their dissertation, and the discipline from which their advisor received their degree.

*Interviews.* The final question on the questionnaires asked individuals if they would be willing to be contacted for a follow-up interview. From that question, contact information for 23 advisees who had received degrees within the field of ILS (as identified in the questionnaire) and 33 advisors was received. These 56 faculty members were emailed individually on March 31, 2009 with a request to participate in a 30-minute follow-up survey. The first 30 individuals to respond to the request were scheduled for an interview. The 30 individuals were evenly divided into 15 advisors and 15 advisees. The advisees selected represented 14 different current institutions and 10 different doctoral institutions (institutions at which they had received their degree). The advisors selected represented 9 different current institutions and 12 different doctoral institutions. In the set of 30 interviewees, 19 unique current institutions and 19 unique doctoral institutions were represented (31 unique institutions across both groups and types).

Participants were emailed one day before their scheduled interview and were given a list of three themes that would guide the interview conversation. Two themes were consistent across
both groups: the difference between an advisee-driven vs. advisor-driven relationship and the extent of collaboration in both the dissertation and products/activities outside of the dissertation. The advisors were additionally asked how they ascertained the individual needs of each advisee and advisees were asked about managing multiple mentors. Twenty-one interviews were conducted between April 13 and April 17 and the remaining 9 interviews were conducted between April 27 and May 1. The interviews were recorded and the digital audio files uploaded into NVivo for analysis. Coding will be done directly from the audio files, rather than through full-text transcription.

Curriculum Vitae. Complete CVs were searched online for all 648 faculty members and were located for 153 (52.04%) of the advisees in the population and 198 (55.93%) of the advisors in the population. The 362 complete CVs will be analyzed for the following information: 1) the discipline, year, and institution at which the faculty member’s doctoral degree was conferred; 2) the faculty member’s current rank; 3) the number of authors per paper on books, conference papers and journal articles; 4) for those who received their degrees in ILS, how many times they have collaborated on publications with their advisor; and 5) for those who have advised dissertations in ILS, the number of times they have collaborated on publications with their advisees.¹ This information will be entered into an Excel spreadsheet and exported into SPSS for analysis.

An additional analysis will be conducted on a small subset of the CVs, for those faculty members for whom a full and complete CV can be found online and a full copy of the dissertation can be found online. As of May 2009, 120 mentees (40.82%) and 84 mentors (23.73%) fell into this category. This list will be additionally modified based on those who

¹ For items 4 and 5, the list of ILS advisors/advisees will be taken from the MPACT database: http://www.ils.unc.edu/mpact/
received their degrees within the field of information and library science. For these individuals, an interdisciplinary boundary crossing index will be calculated and compared to the interdisciplinary borrowing index calculated from the dissertation bibliographies. The information gathered from this stage of the research will provide additional insight into the degree of collaboration of these faculty members with their advisees/advisors and other faculty members; the disciplinary affiliation of the faculty members; and the relationship between collaboration, disciplinary affiliation, and interdisciplinary boundary crossing.

*Dissertation Bibliographies.* Dissertations authored by each of the 648 faculty members were searched on ProQuest’s *Dissertations and Theses* database to see if a full electronic copy was available. 149 fully available electronic versions were located for the mentors (42.09%) and 207 (70.41%) fully available electronic versions were located for the mentees. This list will be further reduced by identifying those that were completed within the field of information and library science. For each dissertation examined, an interdisciplinary borrowing index will be calculated.

The index proposed is informed by Pierce’s (1999) conceptualization of the concept of interdisciplinarity. Using Pierce’s element of borrowing, this index quantifies the degree of borrowing as an index of interdisciplinarity. To assess this, the following formula is suggested:

\[
\frac{d}{0.1 + \frac{i}{n}}
\]

where \(d\) = number of unique disciplines in addition to the core discipline, \(i\) = the number of references classified within the core discipline and \(n\) = the total number of references. For

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2 See the following section for details on the calculation of the interdisciplinarity index.

3 The index can also be calculated using Pierce’s concept of boundary crossing, using a CV as the unit of analysis rather than a bibliography.

4 A pilot study of 15 dissertation completed at a single institution provided valuable refinements and insights into the proposed methods. For instance, for one ILS dissertation coded, there was not a single journal source or monograph that fell into the ILS subject category. Therefore, a constant was added to the denominator to eliminate the possibility of the denominator equaling zero.
example, in the case of an ILS dissertation containing 200 references, 130 of which were classified as ILS, $i$ would equal 130 and $n$ would equal 200. If the remaining 70 references were split across three different disciplines (e.g., education, psychology, and history) $d$ would equal 3.

$$\frac{3}{0.1 + \frac{130}{200}} = 4$$

As an indicator of degree of interdisciplinarity, a higher number would represent a higher degree of interdisciplinarity. For example, considering the example above, if the 70 remaining references had actually been classified into 7 different disciplines, the result would show:

$$\frac{7}{0.1 + \frac{130}{200}} = 9.3$$

The second figure represents a reference list with a higher degree of interdisciplinarity due to the inclusion of more disciplines. While the number of additional disciplines is therefore heavily weighted in this index, the percentage of within-field references also moderates the index. For example, in the figure above, if the denominator were 1.05, indicating that 95% of the references were from the core discipline, the total interdisciplinarity index would decrease, indicating a lower degree of interdisciplinarity. The interdisciplinary borrowing index could be generated for any unit—a single type of source in a reference list, the entire reference list of a single work, all the references from a journal, all the references in a scholar’s oeuvre, etc.

The following steps will be conducted in order to compile an interdisciplinary borrowing index for these dissertations based on journals and monographs:

1) A database will be compiled

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5 Results from the pilot study showed that these were the most frequently cited sources: journal made up 41% of the 2349 references coded, followed by books (30%) and conference proceedings (17%). The remaining categories (including categories for technical reports, dissertations/theses, personal communications, unpublished manuscripts, etc.) each contributed less than 3% to the overall number of references. If the researcher had access to ISI’s conference proceedings citation index, this could also be added into the calculation.
that lists the ID for each dissertation, the year the dissertation was completed, a type code (journal, conference proceeding, book, etc.) and a source title for each reference in the dissertation bibliography. 2) For journals and conference proceedings, a search will be conducted using Ulrich’s, Web of Science, and the ACM Digital Library in order to find the most current title for each source and aggregating all previous titles under one source title name (for example, this would identify American Documentation as a previous title and the Journal of American Society for Information Science and Technology as a current title). 3) Journal titles will be classified by discipline using ISI subject areas. Specifically, the journal titles will be searched in Web of Science and the top “subject area(s)” for the result set will used as an indicator of discipline. 6) Book titles will be classified by discipline using WorldCat. Specifically, the book titles will be searched in WorldCat and the entry utilized by the most libraries will be used to locate the LC class. The general class was used to identify discipline for example, BF = psychology. 7) The interdisciplinary borrowing index will then generated for those references coded as journals or books.

Before application, this index will be tested for face validity, that is, the extent to which the measurement reflects common agreements about the construct (Babbie, 2004). The validity testing will be conducted on a sample of all 29 dissertations completed at a single institution between 2000 and 2007. These dissertations all contain at least one committee member still currently employed at the institution. The validity testing will be conducted by asking faculty members who served on specific dissertation committees to rank the dissertations by their degree of interdisciplinarity. In order to facilitate this, a list of all committee members for the 29

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6 The most frequent subject area will be assigned. In the case of tied subject areas, both will be assigned. It may be noted that this index could function with a variety of classification schemes, such as JCR subject categories, Dewey classification system, etc. Further work may examine which classification scheme provides the highest degree of face validity.
dissertations will be gathered from the MPACT database and a separate instrument will be made for each individual faculty member still currently employed at the institution. The instrument will list any of the 29 dissertations on which they have served (in alphabetical order by author’s last name) and will ask them to rank these from the most to least interdisciplinary. The dissertations will be ranked by the researcher according to their index scores and these rankings will be compared to the rankings obtained from the committee members using Kendall’s *tau*.

This section will provide an understanding of the interdisciplinary influences on the field of information and library science over time. In addition, a comparison with the collaborative behaviors and interdisciplinary boundary crossing index will be used to evaluate the degree to which interdisciplinary behaviors in the dissertation process may be related to collaborative and interdisciplinary behaviors later in the scholar’s career.

**Implications**

Change in the doctoral education process dramatically affects the entire discipline. Doctoral graduates become the next faculty members for the discipline—creating written works, educating the next generation of scholars and practitioners, and imparting norms and values to their own advisees. Examination of this process provides a reflective exercise in which we examine the way in which we are currently “doing science.” A focus on collaborative and interdisciplinary behaviors will provide evidence not only of the current practices within doctoral education, but may also provide an indication of the disciplinary influences and current practices with implications for the broader discipline and the profession. In addition, this work provides a novel metric for calculating interdisciplinarity which can be used for future evaluations of this and other fields.
References


## Schedule of Completion

<table>
<thead>
<tr>
<th>Item</th>
<th>Details</th>
<th>Completion Date</th>
</tr>
</thead>
<tbody>
<tr>
<td>Proposal defense</td>
<td>Successfully defended</td>
<td>January 5, 2009</td>
</tr>
<tr>
<td>Collect survey data</td>
<td>Date survey was closed</td>
<td>March 4, 2009</td>
</tr>
<tr>
<td>Analyze survey data</td>
<td>Quantitative data was analyzed using Qualtrics and SPSS; open-ended questions were coded and analyzed in NVivo</td>
<td>April 5, 2009</td>
</tr>
<tr>
<td>Conduct interviews</td>
<td>Date last interview was conducted</td>
<td>May 1, 2009</td>
</tr>
<tr>
<td>Code and transcribe interviews</td>
<td>Data was transcribed using NVivo and coded in Excel</td>
<td>June 2, 2009</td>
</tr>
<tr>
<td>Collect, code, and analyze CVs</td>
<td>URLs have been gathered; coding will be done using Excel; SPSS will be used for analysis</td>
<td>July 17, 2009</td>
</tr>
<tr>
<td>Collect, code, and analyze dissertation bibliographies</td>
<td>Coding will be done using Excel; SPSS will be used for analysis</td>
<td>September 30, 2009</td>
</tr>
<tr>
<td>Writing of results section</td>
<td>Incorporating analysis from surveys, interviews, CVs, and bibliographies</td>
<td>November 13, 2009</td>
</tr>
<tr>
<td>Full rough draft</td>
<td>Revision of previously written introduction, literature review, and methodology section; incorporating newly written results section; and writing of discussion and conclusion sections</td>
<td>December 31, 2009</td>
</tr>
<tr>
<td>Dissertation defense</td>
<td>Considering the availability of the committee</td>
<td>February 2010</td>
</tr>
<tr>
<td>Revisions, formatting, and submission of final document</td>
<td>Revisions from the committee and formatting/submission according to the Graduate School requirements</td>
<td>March 2010</td>
</tr>
<tr>
<td>Graduation</td>
<td>Anticipated</td>
<td>May 2010</td>
</tr>
</tbody>
</table>
Budget

Two types of items are included on this budget: 1) equipment needed for data collection (particularly equipment that facilitates the collection of interview data); and 2) costs associated with dissemination (particularly the travel to the ASIS&T annual meeting at which a poster on the research will be presented).

<table>
<thead>
<tr>
<th>INTERVIEWS</th>
<th>DESCRIPTION</th>
<th>COST</th>
</tr>
</thead>
<tbody>
<tr>
<td>Phone card</td>
<td>Sam’s Club phone card; 30 phone calls; 30 minutes each; 2.5 cents per minute</td>
<td>$22.50</td>
</tr>
<tr>
<td>Digital recorder</td>
<td>Olympus DS-40 from Best Buy</td>
<td>$149.99</td>
</tr>
<tr>
<td>Phone recording earpiece</td>
<td>Olympus TP-7 Telephone Recording Device from Amazon.com</td>
<td>$17.71</td>
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</table>

**subtotal** $190.20

<table>
<thead>
<tr>
<th>TRAVEL TO ASIS&amp;T</th>
<th>DESCRIPTION</th>
<th>COST</th>
</tr>
</thead>
<tbody>
<tr>
<td>Plane ticket</td>
<td>Raleigh-Durham to Vancouver (as quoted by priceline.com)</td>
<td>$456.00</td>
</tr>
<tr>
<td>Hotel room</td>
<td>Six nights at the Hyatt Regency; sharing the room with one other person; rates: 206 CAD=177.58 USD (plus 16.5% tax)</td>
<td>$620.64</td>
</tr>
<tr>
<td>Airport shuttle</td>
<td>Roundtrip from airport to hotel (price as quoted from Hyatt Regency webpage)</td>
<td>$25.00</td>
</tr>
<tr>
<td>Conference registration</td>
<td>Registration compensated for recipient</td>
<td>n/a</td>
</tr>
<tr>
<td>Poster printing</td>
<td>Costs associated with printing a poster for the ASIS&amp;T AM</td>
<td>$75.00</td>
</tr>
<tr>
<td>Food</td>
<td>Calculation based on UNC’s out-of-state per diem rate of $36.25 for seven days</td>
<td>$253.75</td>
</tr>
</tbody>
</table>

**subtotal** 9 $1430.3

**TOTAL requested** 9 $1620.5

*Additional forms of support*
During the 2009-2010 academic year, I will be employed as a Teaching Assistant with the School of Information and Library Science at the University of North Carolina at Chapel Hill and will receive a stipend of $12,000, in addition to health insurance and tuition remission. I will also receive an additional fellowship of $2,800 for the academic year.
Contact information for advisor supporting proposal

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EDUCATION

Ph.D., Information and Library Science, 2007-present (anticipated graduation May 2010)
School of Information and Library Science, University of North Carolina at Chapel Hill

M.S., Library Science, 2005-2007
School of Information and Library Science, University of North Carolina at Chapel Hill

B.Mus., Music Performance, 2001-2005
Music Department, University of North Carolina at Chapel Hill

RESEARCH

REFEREEED JOURNAL ARTICLES


REFEREEED CONFERENCE PROCEEDINGS


**REFEREED CONFERENCE POSTERS**


**CONFERENCE PRESENTATIONS**


**OTHER PUBLICATIONS**


**TEACHING**

**UNIVERSITY OF NORTH CAROLINA AT CHAPEL HILL**

Spring 2009:
- INLS 501: Information Resources and Services (39 graduate students)

Fall 2008:
- INLS 501: Information Resources and Services (29 graduate students)

**SERVICE**

**PROFESSIONAL**

Deputy Director, ASIS&T Chapter Assembly (2008-current)

Communications Officer, SIG-ED, ASIS&T (2008-current)

Chair, Carolinas Chapter of ASIS&T (2008-current)

Member, *Library Student Journal* Editorial Board (2006-current)
Member, ASIS&T Membership Committee (2006-current)
Reviewer, ASIS&T Annual Meeting (2009)
Member, iSchool Conference Planning Committee (2008-2009)
Member, ASIS&T Watson Davis Award Committee (2008)
Secretary and Co-Founder, Carolinas Chapter of ASIS&T (2007-2008)
Member, Southeast MLA Web Task Force Directory of Collections Committee (2006)

**AWARDS**

**GRANTS, FELLOWSHIPS, ASSISTANTSHIPS**
- Kalp Fellowship (August 2009-April 2010)
- UNC-Chapel Hill Graduate School Doctoral Merit Assistantship (August 2007-April 2008)
- SILS Carnegie Grant (December 2007)
- Graduate School Transportation Grant (November 2007)
- Music Library Association, Kevin Freeman Travel Grant (October 2005)
- Southeast Chapter of the Music Library Association, Travel Grant (October 2005)

**AWARDS**
- ALISE 2009 Best Paper Award (June 2009)
- SILS Outstanding Service to School Award (May 2007)
- Senator of the Year, Graduate and Professional Student Federation (March 2006)
- UNC-Chapel Hill Concerto Competition Winner (November 2002)

**HONOR SOCIETIES**
- Order of the Grail-Valkyries (inducted April 2007)
- Alpha Epsilon Lambda (inducted April 2006)
- Frank Porter Graham Honor Society (inducted March 2006)

**PROFESSIONAL ASSOCIATIONS**

American Society for Information Science and Technology (2006-current)
Association for Library and Information Science Education (2008-current)