Exploring the Use of 'Acknowledgement Analysis' to Map Intellectual Diversity and Cross-disciplinary Activity Within the iSchools

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Abstract
Fostering intellectual diversity in the iSchools is a critical task and central to the unique iSchool vision. However, beyond recent efforts to track hiring patterns and figure out the representation of various disciplines within the iSchool community, there is currently a lack of empirical research about cross-disciplinary activity within iSchool faculties. In this research note, which seeks to build on and complicate a recent paper by Wiggins and Sawyer (2012), we foreground the various zones and activities that make up everyday iSchool life instead of discussing the iSchool as a coherent unit. Specifically, we examine faculty involvement with the dissertation production process as a potentially key zone of cross-disciplinary faculty contact and exchange. We also explore the use of "acknowledgement analysis," a relatively unexplored method for studying academic social networks. Our findings, based on analyzing the acknowledgements of every dissertation published in 2010 (N=78) by a sample of 15 research-intensive iSchools, suggest that the dissertation production process is a site of cross-disciplinary activity but not evenly so across the various disciplines populating the iSchools. Some discipline areas within the iSchools engage in cross-disciplinary exchange more frequently than others and with a more diverse array of intellectual interlocutors.
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1 Introduction

This research note concerns the intellectual diversity of the iSchools. It seeks to build on, and productively complicate, an important study recently published by Wiggins and Sawyer (2012) in which the authors approach the iSchools as "a naturally occurring experiment in the creation of interdisciplinary academic units" (p. 20) and develop a classification system for measuring intellectual diversity within individual iSchools, within clusters of iSchools, and across the entire iSchool community. As Timothy Mitchell (2005, p. 316) has pointed out, the concept of "a natural experiment" can be deceptive because such phenomena are not typically one large experiment unfolding but, on the contrary, many related experiments coalescing into what comes to appear singular and "natural." Mitchell's observations about how natural experiments typically work is key to understanding the research presented in this note.

As has been well documented in the small but existing literature on them, many of the iSchools are amalgamations of older disciplines, departments, schools, and research fields (Olson & Grudin, 2009; Bonnici, Subramaniam, & Burnett, 2009). iSchools are also "moving objects" that continue to innovate and self-adapt in real time. Responding to the lack of empirical data within the recent discussions of iSchool research cultures, Wiggins and Sawyer set out to measure and make sense of the iSchool community's complex organizational and intellectual topography. Their research took place in 2009, when there were 32 iSchools. Using a 21-school sample, Wiggins and Sawyer classified and grouped all (tenure-stream or tenured) iSchool faculty members based on the "discipline area" in which each faculty member had received their PhD (e.g., humanities, management, computing, education, et cetera). According to the authors, this approach was developed based on the notion that a PhD can be used "as a proxy for intellectual interests

and domain expertise" (p. 12) that may change over time, as individual researchers develop new areas of specialization, but never entirely subsides and thus has validity as a general marker of discipline-specific knowledge and orientation. After classifying every faculty member in their sample Wiggins and Sawyer were able to analyze individual iSchools based on the disciplines populating them, cluster the iSchools into various disciplinary leanings (e.g., sociotechnical, library, niche, etc.), and create a provocative snapshot of the larger intellectual currents that existed just before the period of tremendous globalization now underway that has new schools and researchers quickly entering the iSchool community.

As Wiggins and Sawyer note, one limitation of their study was its reliance on secondary data collected from iSchool websites and from the Proquest UMI Dissertation Abstracts database. Nonetheless, their paper breaks new ground in modeling how we might subject the iSchools to the same kind of empirical analysis that we use when studying knowledge production networks in the sciences, social sciences, and humanities. Building on this idea and seeking to further the line of inquiry, we suggest that a second possible limitation within their study is a subtle but underlying assumption that the co-location of researchers from distinct intellectual traditions is a robust indicator of intellectual diversity and cross-disciplinary activity. The research presented in this note takes as its starting point the possibility that some iSchool faculty researchers from distinct research fields and disciplines may have little to no engagement with each other beyond the physical proximity of working together in the same school facilities. Put simply, while mapping person-to-person proximity can reveal hiring patterns and discipline-specific representation across the iSchool community, important things to know, something not quite captured by that approach is the character or volume of whatever intellectual intermixing is (or is not) happening within any given iSchool.

Following Mitchell's point cited above, we suggest that iSchools are in fact comprised of many *small* experiments in cross-disciplinary activity and that these experiments take place within everyday "contact zones" of faculty intermingling and collision, to borrow a term from Mary Louise Pratt (1998, p. 34). The advantage of this framework over an approach that foregrounds physical co-location, we argue, is that it re-scales intellectual diversity into doable units of activity that are open to small-scale interventions and tinkerings, as well as open to empirical study on a zone-by-zone or experiment-by-experiment basis. Some of the likely cross-disciplinary faculty contact zones within an iSchool might include: hiring committees, curriculum committees, co-PI projects, co-teaching arrangements, special school-wide initiatives, administrative and governance bodies, special research projects, and more. We suggest such zones function like hot spots on a climate map, as discrete sites of exposure in which faculty researchers encounter terms, ideas, and approaches from other disciplines; these zones are where intellectual cross-pollination does or does not happen on a quotidian basis within the iSchools. Of course, not all such zones of are open to empirical study and investigation by outsiders. Some involve closed or confidential discussions, or they fail to generate records and data for analysis.

This research note presents some of our early findings about the iSchool dissertation process as a potentially key contact zone that facilitates cross-disciplinary exchange and activity among iSchool faculty members. We chose to begin our investigations of intellectual diversity with the dissertation process because the dissertation process often, but not always, results in a published knowledge product, the dissertation, and that knowledge product typically contains some kind of record, usually in the form of an acknowledgements section, that identifies the various faculty researchers involved in the dissertation process regardless of their disciplinary background or positioning. This research note also has a secondary "proof of concept" agenda in that we discuss a relatively new and novel method called "acknowledgement analysis." The two research questions guiding this work are the following: Is the dissertation process a site of cross-disciplinary faculty contact and activity within the iSchools? Can "acknowledgement analysis" be used to map or model some of that contact and activity?

2 Using Acknowledgement Analysis to Study the Dissertation Process as a Faculty Contact Zone

As indicated by its name, acknowledgement analysis draws obvious inspiration from the well-known method of citation analysis. It differs from citation analysis in that it privileges a published work's acknowledgements section as a unique and revealing data source with the potential to reveal new types of information about the academic production process. Similar to a citation, an acknowledgement serves as a reward that can impact a faculty member's career advancements (Sonnenwald, 2009). But citations and acknowledgements differ in that an acknowledgement is an (intentional) reward deemed valuable by an author yet acknowledgement "counts" have not (yet) emerged as an accepted tool for calculating someone's influence and impact on a research field or discipline. Put simply, citations are commonly counted and have value but acknowledgements are not commonly counted and do not have the same value within the wider research community. Moreover, acknowledgement analysis remains relatively unexplored as a method. To date, the small amount of published literature using acknowledgement analysis has focused largely on identifying funders and funding patterns (e.g. Wang & Shapira, 2011).

Our research considerably expands the use of acknowledgement analysis by focusing on the social networks underpinning the academic knowledge production process. However, what makes acknowledgements particularly rich as a data source is that acknowledgements often traffic in a relatively "flat ontology" (DeLanda, 2005). For example, the acknowledgement section of a single dissertation might mention or thank: senior researchers, junior researchers, external committee members, parents, siblings, roommates, friends, peers, co-workers, lovers, ex-lovers, program administrators, lab managers, librarians, archivists, dogs, cats, grant managers, coffee shops, coffee shop workers, coffee makers, Vietnamese restaurants, Indian restaurants, research subjects, local bars, a bicycle, a laptop, an unborn niece, an entire graduate faculty, computer equipment, government officials, tech support, grandparents, postdoctoral researchers, funding agencies, information visualization experts, duplication shop managers, fellowship administrators, conference attendees, a curator, the ocean, a therapist, and more. According to acknowledgements sections, a dissertation often involves an intricate web of relationships that are far more complex than the term "academic social network" typically suggests.

Despite these complexities, the research for this current study focused exclusively on human actors mentioned in iSchool dissertation acknowledgements within a one-year time frame, 2010. For convenience sake, and because we are presently more concerned with exploring acknowledgement analysis as a method than making final, defensible claims about the iSchools overall, we did not survey the entire iSchool caucus but instead chose the 15 schools or departments currently listed on the iSchools Directory (http://ischools.org/directory/) that conferred the most doctoral degrees between 1930 and 2007 (Sugimoto, Russell & Grant, 2009, Table 3). We performed a content analysis of iSchool dissertation acknowledgements and produced a social network analysis of the faculty members mentioned within every iSchool dissertation emerging from one of the iSchools in our sample. In order to collect dissertation acknowledgments in the sampled iSchools, we first utilized the MPACT database (http://www.ibiblio.org/mpact/) and obtained directory information including dissertation titles, schools, years, and author names. We then used author names and institutions as keywords to search the ProQuest Dissertations & Theses Database. Table 1 shows the number of dissertations in each sampled school in 2010, along with the actual number of acknowledgements we were able to access.

Sampled dissertation		Acknowledgement found	%
UNC	14	13	93
Pittsburgh	13	6	46
FSU	7	6	86
Rutgers	7	5	71

UIUC	7	7	100
UNT	7	7	100
Toronto	6	4	67
Michigan	5	4	80
Indiana	4	2	50
Syracuse	3	2	67
UCLA	3	3	100
Drexel	1	1	100
Maryland	1	1	100
UT-Austin	0	0	--
UW-Madison	0	0	--
Total	78	61	78

Table 1: The Number of Sampled Acknowledgement across iSchools in 2010

Next, using the "discipline area" classification system developed by Wiggins and Sawyer (2012, p.11), we coded the dissertation authors and all of the faculty names appearing within the acknowledgements sections. We found 269 names classifiable as faculty, 16 funding sources, and 782 people in the personal category within 61 cases. Names that related to an academic institution in a staff capacity such as librarians, lab technicians, etc. were considered as personal acknowledgements and not included within our current study (see Table 2 for examples). Most information about acknowledged faculty was gleaned from CVs available from either departmental or personal web sites. Where this was not possible, alternate online profiles (e.g., LinkedIn) served as the source for information related to degree and institution. Only 4 instances occurred where no information could be located.

#	Text	Name acknowledged	Relationship (Type of assistance)
1	I would like to express my deepest gratitude to my advisor, Dr. Joseph Kabara, who constantly inspires, encourages, and guides me through the problems in my research.	Dr. Joseph Kabara	academic
2	I would like to gratefully acknowledge Charles Lowry, Director of Sales & Marketing - Incisive Legal Intelligence, a division of Incisive Media Inc., and Rob Calcagni, VP Client Solutions - Outsell, Inc. for granting access to some of their firms' research studies which greatly influenced the quality of this dissertation.	Charles Lowry	funding
3		Rob Calcagni	funding
4	…Dan always has the courage to tell me what I need to hear, even when I don't want to hear it. I'm thankful for his patience while I finished this document, and I'm excited to face life's next challenges with him.	Dan	personal

Table 2: Coding Examples

3 Problems and Challenges with Using Acknowledgement Analysis

Various problems and challenges arose during our research process that shed light on the promise of acknowledgement analysis as a method, and on its potential limitations or pitfalls. One challenge that we encountered is that some dissertations contained no acknowledgements. This prompted secondary reviews of all instances where no acknowledgement had been found. No errors were discovered. A second challenge that we encountered is that naming conventions in dissertations are not universal. While most dissertations contained explicit "Dedications" and "Acknowledgements" sections, some authors employed alternate headings for their acknowledgements section such as "Preface." In terms of future research attempting to make use of acknowledgement analysis, this small but meaningful variation in naming conventions is likely to be found in other academic knowledge products that engage in acknowledgement activities, such as books and journal articles. Moreover, there exists the possibility that acknowledgement culture has changed over time and varies across academic formats. For example, some emergent forms of (digital) scholarly practice may not contain acknowledgements or their equivalent. Whether and how acknowledgement practices vary across formats or are changing along with recent developments in scholarly communications is a topic outside the scope of this paper but likely represents a research gap and opportunity ripe for future study.

4 Findings, Discussion and Next Steps

Our early and partial results suggest that the iSchool dissertation process is indeed a faculty "contact zone" within the iSchools, and that acknowledgement analysis can be used to map or model some of that cross-disciplinary contact and activity. For example, in 2010, there was a particularly traceable intermixing between "information" faculty and "library" faculty via the dissertation production process. Table 3 displays the distribution between disciplines as related to information authors and library authors, respectively. Perhaps unsurprisingly, no two iSchool discipline categories came into as much contact via the dissertation contact zone as "library" and "information." In the 380 pairs of interaction, 38.9% of them were found within these two disciplines, including same-discipline combinations (i.e. information-information, N=53 and library-library, N=34) and cross-discipline combinations (information-library, N=29 and library-information, N=32).

Rank	Source (Author)	Target (Scholar)	Occur.	%
1	Information	Information	53	20.7
2	Information	Science & Engineering	38	14.8
3	Information	Social & Behavioral	29	11.3
3	Information	Library	29	11.3
5	Information	Computing	27	10.5
6	Information	Management & Policy	26	10.2
7	Information	Humanities	20	7.8
8	Information	Communication	17	6.6
8	Information	Education	17	6.6
Total			256	100

Rank	Source (Author)	Target (Scholar)	Occur.	%
1	Library	Library	34	27.4
2	Library	Information	32	25.8
3	Library	Computing	14	11.3
4	Library	Education	12	9.7
5	Library	Humanities	9	7.3
6	Library	Social & Behavioral	8	6.5
7	Library	Communication	6	4.8
8	Library	Science & Engineering	5	4.0
9	Library	Management & Policy	4	3.2
Total			124	100

Table 3: Number of pairs of discipline interactions between authors and scholars (N=380)

Something unanticipated within our results, however, is a further suggestion that cross-disciplinary engagement, at least within the contact zone of dissertations, is not occurring evenly. Figure 1 illustrates the divisions of the acknowledged faculty across the disciplinary classification scheme. Patterns of contact differ between the library authors (in the blue area) and the information authors (in the tan area), respectively. This shows that dissertations that involve students who can be classified as falling within the "information" discipline (N=39) using the Wiggins-Sawyer scheme not only link with faculty from a larger number of other disciplines (e.g., science & engineering, social & behavioral, management & policy, etc.) than "library" authors (N=22) but that such cross-disciplinary contacts were also more frequent. In other words, dissertations involving an information dissertator are more likely to become, and more frequently, cross-disciplinary exercises in new knowledge creation that bring faculty from distinct disciplines into synchronous or asynchronous contact with one another. Because our research did not limit itself to formal dissertation committee membership but included any faculty member listed within a dissertation's acknowledgements, this result is unlikely to be an effect of local rules and policies about dissertation committee composition.

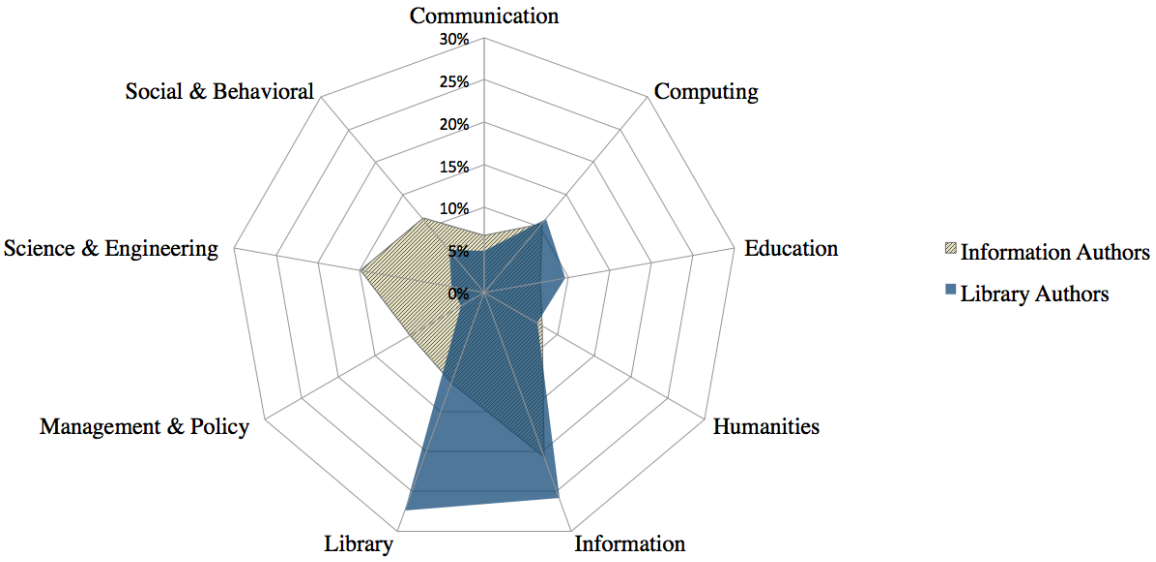

Figure 1: Distribution of pairs of disciplines, grouped by information authors and library authors

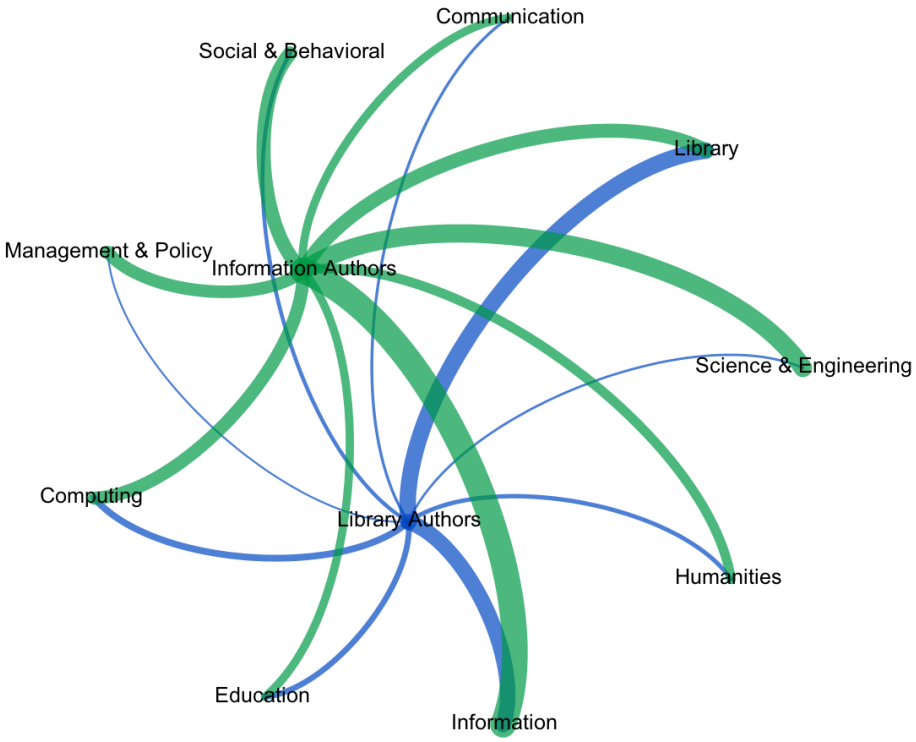

Figure 2: Distribution of pairs of disciplines, grouped by information authors and library authors (Alternate rendering of Figure 1)

There are several possible directions for future research. Widening our sample to include all of the iSchools would allow us to make more comprehensive claims about the iSchool community and the role of the dissertation process as a cross-disciplinary contact zone. Expanding the chronological scope of our research to include past years would allow for longitudinal analysis. We could begin with targeted intervals (e.g., 1990, 1995, 2000, 2005) to map broader cross-disciplinary trends within the dissertation contact zone followed by a year-by-year analysis that reveals change over time in a more refined fashion. Finally, the dissertation process contact zone could be compared to some of the other likely cross-disciplinary faculty contact zones listed above (e.g., hiring committees, governance bodies, etc.) to begin cross-zone comparison and identify which zones are the liveliest and most successful intellectual diversity hotspots at the iSchools.

Although we concede, in theory, that the mere presence of faculty from different disciplines affords greater opportunities for cross-disciplinary collaborations, we echo the call made by Wiggins and Sawyer that more empirical research is needed to make sense of intellectual diversity within the iSchools. De-privileging physical co-location, this note approached the iSchools as institutions comprised of many small experiments in cross-disciplinary activity— everyday "contact zones" in which faculty intermix intellectually. This note, which focused on the dissertation production process as one such contact zone, also had a secondary "proof of concept" agenda pertaining to the use of "acknowledgement analysis" as a method. The preliminary findings presented here suggest that dissertations do bring faculty from different "discipline areas" into synchronous or asynchronous contact with one another, and that acknowledgement analysis can reveal some of those cross-disciplinary intermixings. However, such intermixings are not happening evenly across the discipline areas. For example, in 2010, the dissertation production process in the discipline area of "library" was intellectually diverse with less frequency and with a narrower range of pairing disciplines than the dissertation production process in "information."

5 References

Bonnici, L. J., Subramaniam, M. M., & Burnett, K. (2009). Everything old is new again: The evolution of library and information science education from LIS to iField. Journal of Education for Library and Information Science, 263-274.

DeLanda, M. (2005). Intensive science & virtual philosophy. Continuum International Publishing Group.

Mitchell, T. (2005). The work of economics: how a discipline makes its world. European Journal of Sociology, 46(02), 297-320.

Olson, G. M., & Grudin, J. (2009). The information school phenomenon. interactions, 16(2), 15-19.

Pratt, M. L. (1998). Arts of the contact zone. Negotiating academic literacies, 171-185.

Sonnenwald, Diane H., et al. "Exploring new ways of working using virtual research environments in library and information science." Library Hi Tech 27.2 (2009): 191-204.

Sugimoto, C. R., Russell, T. G., & Grant, S. (2009). Library and information science doctoral education: the landscape from 1930-2007. Journal of Education for Library and Information Science, 190-202.

Wang, J., & Shapira, P. (2011). Funding acknowledgement analysis: an enhanced tool to investigate research sponsorship impacts: the case of nanotechnology. Scientometrics, 87(3), 563-586.

Wiggins, A., & Sawyer, S. (2012). Intellectual diversity and the faculty composition of iSchools. Journal of the American Society for Information Science and Technology, 63(1), 8-21.

6 Table of Figures

7 Table of Tables