"It's in the Syllabus": Identifying Information Literacy and Data Information Literacy Opportunities Using a Grounded Theory Approach

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ABSTRACT

Developing innovative library services requires a real world understanding of faculty members' desired curricular goals. This study aimed to develop a comprehensive and deeper understanding of Purdue's nutrition science and political science faculties' expectations for student learning related to information and data information literacies. Course syllabi were examined using grounded theory techniques that allowed us to identify how faculty were addressing information and data information literacies in their courses, but it also enabled us to understand the interconnectedness of these literacies to other departmental intentions for student learning, such as developing a professional identity or learning to conduct original research. The holistic understanding developed through this research provides the necessary information for designing and suggesting information literacy and data information literacy services to departmental faculty in ways supportive of curricular learning outcomes.

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INTRODUCTION

Academic libraries have launched multiple initiatives addressing the 21st century teaching, learning and research needs of faculty, administration and students. Developing innovative library services requires a real world understanding of both the desired goals of faculty, and current practices in the lab and classroom. While the ties we develop with these groups may inform the development of strategic directions, many values and goals are implicit to members of a department and may not be readily accessible to librarians. In this project we aimed to develop a comprehensive and deeper understanding of faculty expectations for student learning related to information and data information literacies. We used *grounded theory*, an approach by which new understandings are derived through an inductive analysis of original data (Glaser & Strauss, 1967), in this case course syllabi. Course syllabi represent a useful artifact of study as they articulate learning goals, expectations, and desired outcomes, details on assignments and often the rubric by which students will be evaluated. The depth of the analysis afforded by using grounded theory techniques not only allowed us to identify how faculty were addressing information and data information literacies in their courses, but also enabled us to understand the interconnectedness of these literacies to other departmental intentions for student learning, such as developing a professional identity or learning to conduct original research. Advancing the Purdue Libraries' information literacy and data services initiatives, the deeper understanding resulting from our grounded theory approach will enable the liaison librarians involved in this project to craft targeted responses aligning with the learning goals of departments and key faculty.

LITERATURE REVIEW

A syllabus is typically considered an expression of an instructor's intentions for learning in a course. Collectively, syllabi for a specific program may represent a departmental faculty's curricular aims for student learning. Research activities and practices have been associated with disciplinary classifications: hard pure (e.g., physics and biology), hard applied (e.g., engineering and medicine), soft pure (e.g., history and sociology) and soft applied (e.g., marketing and communications) (Biglan, 1973a,b). While earlier studies about disciplinary cultures focused on scholarship, teaching practices also vary in ways aligning with Biglan's classifications (Lattuca & Stark, 1994; Neumann, 2001). This includes information literacy teaching practices. In a study of how information literacy is experienced by higher education academics, faculty from disciplines associated with each of the Biglan classifications were interviewed (Webber, Boon, & Johnston, 2005). Initial results suggested that faculty who teach marketing may view information literacy as integral to becoming an independent marketing professional, while faculty teaching English tend to separate information literacy from disciplinary learning. Disciplinary culture has been found to be the key driver in

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curriculum development, with institution-wide and external concerns having less direct influence (Stark, Lowther, Bentley, & Martens, 1990).

If syllabi should represent disciplinary cultures and reveal the aims and values of the instructor, librarians may use them to gain a better understanding of how to structure library services to connect with faculty and students more effectively. Sayles (1985) recognized the power of syllabi analysis for informing library interests, referred to syllabi as a "gold mine of information" to aid librarians in their support of teaching. Rambler (1982) is attributed as being the first to conduct syllabi analysis research, and analyzed 162 randomly sampled syllabi from one semester of courses at a large public institution to determine library usage. This research opened a pathway for numerous studies analyzing syllabi, which primarily focused on determining how library resources are used in coursework (Dewald, 2003; Lauer, Merz, & Craig, 1989; Sayles, 1985; Smith et al., 2012; Williams, Cody, & Parnell, 2004). These studies typically used similar frameworks to examine library-related concerns, such as the use of reserve services or reading materials not on reserve and the extent of library research.

More recent syllabi analysis studies have focused on information literacy (Boss & Drabinski, 2014; Dinkelman, 2010; O'Hanlon, 2007; VanScoy & Oakleaf, 2008). In general, these studies focused on a specific program, although VanScoy and Oakleaf (2008) used syllabi analysis to explore information literacy outcomes and coursework in courses taken by students during their first semester. As outlined in Table 1, this body of research identified learning outcomes and assignments related to information literacy. Reflective of libraries' evolving need to become more directly involved in curriculum, these studies expand the aim of syllabi analysis beyond determining how library resources are utilized. This research identified what students were expected to do in their coursework in order to develop responsive library support that may include efforts to expand a curriculum to focus more on information literacy.

With the advent of government funding agencies, the National Science Foundation in particular, requiring researchers to develop and submit data management plans with their grant applications, academic libraries are seeing opportunities to apply their expertise in organizing, describing, disseminating and preserving information towards research data (Tenopir, Sandusky, Allard, & Birch, 2014). More recently librarians are expanding their instructional scope to address researchers' needs in producing data sets (Coates, 2014). Researchers are increasingly being asked to manage their data in ways enabling others to discover, understand and use the data for their own purposes and to ensure its longevity beyond the project or purpose it was originally created for. However, many research fields lack established norms and practices in managing, sharing and preserving their data, making it difficult for researchers to respond to these pressures effectively. Recognizing a need, many librarians are developing "data information literacy" programs to raise awareness amongst researchers and help students improve their practices in working with research data (Carlson & Johnston, 2015; Peters & Vaughn, 2014). Data information literacy is distinguished from data literacy, which emphasizes interpreting, analyzing and other aspects of consuming data. In contrast, data information literacy focuses on the production of research data as well as its consumption. It centers on the treatment of data as objects of scholarly value in and of themselves,

necessitating deliberation and action towards their management, dissemination and preservation to ensure their fitness for discovery and use beyond their original purpose (Carlson, Fosmire, Miller, & Sapp Nelson, 2011). Developing an effective data information literacy program can be challenging as it is often difficult to identify potential needs of students and to align programmatic responses with existing cultures of practice. We anticipated that a critical analysis of syllabi could facilitate a better understanding of faculty expectations for their students regarding working with research data, which in turn could be used to inform data services and data information literacy programs specifically offered by the library.

METHODOLOGY

Our research takes a different approach to analyzing syllabi than earlier studies. One difference is that we examined syllabi for data information literacy and information literacy indicators. More importantly, we first identified overall themes in the syllabi, including information and data information literacies and then determined how these themes related to one another to develop a comprehensive understanding of curricular aims. This approach not only helped us acquire a richer understanding of an individual instructor's intent and needs for a class, but also enabled us to see connections and relationships between each class and the corresponding departmental intent and needs. This understanding positioned us to reach out to these departments and engage them in more meaningful ways.

In this study we asked, "How are information and data information literacies addressed in discipline-specific curricula?" As with earlier syllabi analysis research, we selected departmental curricula at Purdue University to investigate and then collected all available syllabi for those courses. To the degree possible, we wanted to understand information and data information literacies from the perspective of the faculty members who developed the curricula. Therefore, we rejected research approaches in which the analysis relied on an existing information or data information literacy framework to explain the findings. *Grounded theory* was adapted to guide our data analysis. Developed by Glaser and Strauss (1967), grounded theory is an inductive methodology by which theory is typically discovered through an analysis of original data. Although our aim was not generating a theory, the methods used in grounded theory research enabled us to reveal faculties' curricular intentions for information and data information literacies.

SELECTING DEPARTMENTS AND COLLECTING SYLLABI

The departments of nutrition science and political science at Purdue University were selected for this study for two reasons. First, the library subject liaisons involved in the project had a strong interest in exploring how information and data information literacies were addressed in these curricula. Second, we wanted to explore disciplinary differences related to how information literacy and data information literacy were addressed through coursework. As exemplified by the two departments chosen for this study, departments may have widely varied practices regarding syllabi sharing. The Purdue nutrition science program shares

Table 1
Syllabi analysis studies focused on information literacy (IL).

	Curricular scope	Data	Focus
Dinkelman (2010)	Biology program	104 syllabi	IL learning outcomes and assignments, use of external sources and scientific literature, citation style, and library use
VanScoy and Oakleaf (2008)	First semester students	Available syllabi for courses taken by 350 students during their first semester	Research tasks required of first-semester students
O'Hanlon (2007)	General education	71 syllabi	Research skills in learning outcomes and assignments, types of information resources required and IL instruction
Boss and Drabinski (2014)	Business program	79 syllabi	IL and librarian use in School of Business courses