Chapter 3: Mapping Technical Communication as a Field: A Co-Citation Network Analysis of Graduate-Level Syllabi

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Abstract: Echoing their earlier 2001 commentary, Johndan Johnson-Ei-lola and Stuart A. Selber (2004) wrote in the introduction of *Central Works in Technical Communication* that technical communication must develop "a coherent body of disciplinary knowledge" in order to become a mature discipline and profession (p. xxvii). We revisit the question of the field's coherence and maturity, providing an update on Elizabeth Overman Smith's (2000a, 2004) citation analyses of the field in which she provided a set of "points of reference." We might look to such an identifiable body of core texts as an argument for coherence, as core texts are essential to defining a discipline. This chapter provides a co-citation network analysis of texts assigned in 60 graduate syllabi for courses on the foundations of technical communication. We use social network and citation analysis tools to identify 82 core texts that we argue constitute "a coherent body of disciplinary knowledge" and signal adequate maturity in our field to move past our disciplinary anxiety of inadequacy and underdevelopment.

Keywords: co-citation, social network analysis, disciplinarity, graduate education, syllabus

In the 1970s and 1980s, technical communication emerged as an academic field that studied, theorized, justified, defined, and developed pedagogy for the professional practice of technical communication. Early work like Carolyn R. Miller's (1979) "A Humanistic Rationale for Technical Writing" and David Dobrin's (1983) "What's Technical About Technical Writing?" sought to differentiate the study of technical communication from other academic English studies and to complicate the teaching of technical writing as more than the direct conveyance of facts. Workplace studies by Jack Selzer (1983), Dorothy Winsor (1990), Stephen Doheny-Farina (1986), and others explored and established methods for understanding and modeling how technical professionals used language to accomplish technical tasks on the job.

Over the decades following these foundational arguments, scholars in technical communication continued to be concerned with both the status of technical communication practitioners (e.g., Hart-Davidson, 2001; Henry, 2000; Johnson-Eilola, 1996; Kynell-Hunt & Savage, 2003-2004; Savage, 1999; Slack et al., 1993; Wilson, 2001; Wilson & Wolford, 2017) and the legitimacy and status of technical communication as an academic discipline (Grove & Zimmerman, 1997; Johnson-Eilola & Selber, 2001, 2004; Pinelli & Barclay, 1992; Rude, 2009; Smith 2000a, 2000b, 2004; Staples, 1999; Wahlstrom, 1997). Scholars expressed concern about the identity, coherence, and institutional locations of technical communication. For instance, Johndan Johnson-Eilola and Stuart A. Selber (2001) noted that the field lacked "a coherent body of knowledge in both the academy and workplace" (p. 407). To respond to this problem, they argued for a model of graduate education that "organizes the field by locating its modes of analysis in the three-dimensional space of thinking, doing, and teaching" (p. 405). In the preface to their much-used collection *Central Works in Technical Communication* (*CWTC*), Johnson-Eilola and Selber (2004) reiterated their concerns about the field's lack of coherence: they identified technical communication as an "intellectual enterprise" having the proto-elements of a discipline, but lacking a "coherent . . . framework" around which these elements could coalesce (p. xv). They wrote, "Our field will not achieve the status of a mature profession until it can come to grips with a coherent body of disciplinary knowledge" (p. xxvii). The goal of *CWTC*, then, was to identify and organize a set of scholarly papers that can be a coherent discursive center for understanding technical communication as a discipline.

Nearly two decades after the publication of *CWTC*, we ask, How coherent or dispersed is technical communication as a scholarly field? Has the field matured, developing a shared body of knowledge, shared modes of thinking and methods, and shared broad research questions that help to develop the field as a discipline or "mature profession" (Johnson-Eilola & Selber, 2001, p. 408)? One way to approach this question is through methods of citation analysis. Elizabeth Overman Smith (2000a) analyzed citations in five technical communication journals over a period of ten years (1988-1997). By studying over 25,000 citations, she identified a list of 163 heavily cited texts that constituted shared "points of reference" for the field, or those texts that have been influential in shaping the field and "are representative of the knowledge base for technical communication" (p. 452). In a follow-up study, Smith (2004) narrowed this list of 163 points of reference down to 26 texts to provide "an important, magnified view" of the field (p. 53). Drawing on Stephen Toulmin (1972), Smith (2004) understood points of reference as a *transmit*: "a group of texts that record the conversations of the members of the discipline and their use of the concepts and the procedures that make up the discipline's activities" (p. 51). From her analysis, Smith (2000a) proposed that these texts show the field's shared interest in certain topics: "discussions of professional issues (defining technical communication, pedagogy, and research methods), rhetoric and the rhetorics of communities, document design and tech-

nology issues, and workplace communication" (p. 438). Further, she argued, "As a discipline, technical communication has developed depth and rigor" with a broad, interdisciplinary research and theoretical base (2000b, p. 131). While now two decades old, Smith's analyses showed that in the 1980s and 1990s, technical communication as a field was developing a strong interdisciplinary approach to research and journals in the field were increasing in relevance and prestige. Further, her analyses showed that there was a corpus of texts that seemed central to scholarship in technical communication.

This chapter provides an update on Smith's work and presents a co-citation network analysis of 60 graduate syllabi for courses on the foundations of technical communication. While Smith (2000a, 2000b) relied on raw citation counts in her studies, we turn to co-citation network analysis, which combines the approaches of citation analysis in information science with the approaches of social network analysis developed in sociology (De Bellis, 2009; de Solla Price, 1965; Healy, 2013; Otte & Rousseau, 2002; Small, 1973; Wang, 2012). We propose co-citation network analysis as a problem-solving approach that "maps" the field: the citation maps of syllabi that we develop in this article show us what scholarship we value, how coherent or diffuse the field is, and what graduate-level teachers hope to pass on to graduate students entering the field. In *The Structure of Scientific Revolutions*, Thomas Kuhn (1970) explained that a discipline develops coherence through a shared "research tradition" that is transmitted to new members of the field through an agreed-upon body of scholarship (p. 11). As Collin Gifford Brooke (2011) explained, scholars have mental maps of a discipline as a network, privileging certain texts as more central to the discipline and making connections between texts. We hope to explore how these networked maps are transmitted to graduate students and if there are shared understandings of the discipline (that is, coherence) across the field.

In this chapter, we use the concepts *coherent* and *diffuse* to discuss disciplinarity. While disciplines are described and defined in a variety of (sometimes conflicting) ways, one common identifier is the coherence of a shared body of knowledge or texts. For example, Annette Shelby (1996) wrote, "the notion of a discipline implies the existence of a coherent—though necessarily dynamic—body of knowledge organized around central theoretical propositions and paradigms that are subject to ongoing challenges and necessary revision" (p. 99). These theoretical propositions and paradigms are often conveyed through a collection of texts, which are sites of knowledge-making practices for disciplines (Hyland, 2004) and assist in the work of enculturating new members of the field into the discipline (Kuhn, 1970; Toulmin, 1972). Thus, we understand disciplinary *coherence* as marked by agreement about a set of texts foundational to the field, what Smith (2000a, 2004) called "points of reference." While we use *diffuse* somewhat in contrast to *coherence*, we also want to caution that these two concepts are not dichotomous, as many disciplines are both coherent and diffuse. A healthy discipline, we believe, has a degree of coherence around a recognizable body of shared disci-

plinary knowledge and a degree of diffusion. As Gwendolynne Reid and Carolyn R. Miller (2018) observed, "all disciplines can usefully be thought of as 'diffuse'" because of new avenues of research and overlap or networked relationships with other disciplines (p. 105). Thus, the question is not whether technical communication as a field is diffuse, but rather if it is *too diffuse* so that it lacks coherence.

We begin this chapter by providing a sketch of concerns about technical communication's coherence over the last few decades. We then provide a discussion of our methods and methodology; we argue for a mapping approach to understanding a scholarly field that draws on the methods of co-citation network analysis. While we are not analyzing citation networks, and are instead analyzing what texts are assigned in graduate-level courses, we find the methods of co-citation network analysis useful in mapping the landscape of a discipline. After we overview our data collection methods and present network graphs created in Gephi (open-source network analysis software), we develop co-citation maps to determine the field's coherence and to locate an updated list of points of reference that help to constitute technical communication as a discipline. We then link our findings to the questions about technical communication's coherence as a field. By using co-citation network analysis, we can better understand the maturity of the field.[1]

◼ Technical Communication: Coherent or Too Diffuse?

As with any new discipline, technical communication has grappled with how coherent or diffuse its body of scholarship is: is there a shared textual tradition that provides the field with coherence, or is the discipline too diffuse and dispersed with a wide array of interdisciplinary traditions that prevent a shared research agenda? In their *Technical Communication* article, for instance, Thomas E. Pinelli and Rebecca O. Barclay (1992) questioned if technical communication was too interdisciplinary, lacking "a substantial, coherent, and esoteric body of

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1.   We became interested in this project after reading Dan Wang's (2012) co-citation analysis of sociology syllabi during Collin Gifford Brooke's "Rhetorics and Networks" workshop at the 2015 Rhetoric Society of America Summer Institute. Greg was slated to teach Foundations of Technical Communication in Fall 2015, and we thought this was an opportunity to not only study the field from another angle, but also introduce graduate students to both the complexity of the field and the challenges of data collection, entry, and coding. After we collected an initial sample of 24 syllabi, we worked with graduate students (at both the M.A. and Ph.D. level) in Greg's course to create a data entry schema and asked each student to enter data into spreadsheets for one or two syllabi. Michael then cleaned some of the data (ensuring consistency across the data) and shared some initial findings from the social network analysis with the class later in the semester. This activity was a useful one for students, as it helped reveal that the field is interpreted in different ways by different teachers, yet there are also recognizable trends in how to approach introducing graduate students to the field. Additionally, it served as an introduction for many graduate students to replicable methods and data coding and entry.

specialized knowledge," without which research is "fragmented" (p. 528). While some scholars in the late 1990s and early 2000s argued that the field had developed "disciplinary maturity" (Staples, 1999, p. 153), that technical communication journals had "become more academically rigorous" (Smith, 2000b, p. 169), and that doctoral students' research was robust and thriving (Rainey, 1999), concerns about disciplinary coherence, and thus legitimacy and identity, continued. Billie Wahlstrom (1997) noted that despite these successes, research in technical communication lacked "a unifying vision . . . [which] has hurt technical communication's development of a coherent and rigorous research agenda" (p. 307). Laurel Grove and Donald Zimmerman (1997) wrote, "technical communication needs to emerge as a legitimate and respected academic research discipline" (p. 157), suggesting that the field "must identify the body of knowledge that summarizes its most influential and scientifically sound research and practical application guidelines" (pp. 158-159). To do otherwise, they argued, would risk technical communication remaining "undisciplined" (p. 159). And in the introduction to *Reshaping Technical Communication*, Barbara Mirel and Rachel Spilka (2002) wrote about the field's "identity crisis," expressing concern that disparate research projects wouldn't cohere "toward a common objective" (p. 4). Gerald Savage (1999) added that "academics and practitioners are not clearly related by a common body of knowledge" (p. 369). While prospects were good for continued robust research, technical communication scholars were still concerned about the field's coherence, status, and value around the turn of the century.

If more recent scholarship is any indication, these concerns continue today. Respondents to Ann Blakeslee's (2009) questionnaire about technical communication research expressed that the field lacked a coherent research agenda. Carolyn Rude (2015) challenged the field to mend the growing gap between research and practice and expressed concern about the diffuse research in technical communication: "Diffusion comes with the cost of identity and impact" (p. 370) and "Isolated projects do not readily create a coherent whole that contributes to what we mean academically by technical communication" (p. 375). Elsewhere, Rude (2009) suggested that the field lacked coherence in part because it had not yet identified a set of "overriding research questions" (p. 174). Most recently, Kirk St.Amant and Lisa Melonçon (2016) observed that the field "has a problem of incommensurability" "due to a lack of common, unifying goals"; thus, there's a need for the field to develop some "common ground" (p. 270). Clearly, the coherence of technical communication as a field continues to be a concern of scholars: without this coherence, the field lacks disciplinary identity and status.

Importantly, new members of a discipline are enculturated into the field through graduate education. Learning the shared concepts, questions, methods and—significantly—textual traditions occurs in part during graduate school. Particularly, a course like Foundations of Technical Communication makes an argument to students (as well as to other stakeholders) that *this is the tradition of the field from which we build*. Courses like this introduce students to texts that

serve as transmits—students are introduced to points of reference that help to enculturate them into the discipline (Toulmin, 1972). We propose that one way to study the field's coherence or diffusion—and thus status—is to attend to the arguments made by graduate-level syllabi about what constitutes the field and what kind of scholarly conversations graduate students are introduced to. In this chapter, we study these syllabi and "map" the field through methods of co-citation network analysis.

■ Mapping a Discipline and Co-Citation Network Analysis

Cartographic metaphors and mapping practices have become common methodological approaches and metaphors for understanding fields, disciplines, and curricula in both technical and professional communication and rhetorical studies (e.g., Glenn, 1997; Mueller, 2017; Peeples & Hart-Davidson, 2012; Rude, 2009; Slack, 2003; Sullivan & Porter, 1993, 1997; Tirrell, 2012; Unger & Sánchez, 2015; Yeats & Thompson, 2000). Following Patricia Sullivan and James E. Porter, we understand mapping as a postmodern methodology that doesn't seek to represent a "static reality" (1997, p. 79) but rather allows for "a dynamic pluralism" (1993, p. 392). Thus, we attempt to map technical communication as a discipline by *locating* its textual traditions rather than attempting to provide a "common meaning" of technical communication that "exclud[es] enriching diversities" (Sullivan & Porter, 1993, p. 391).

Mapping, too, has been a common approach in information sciences, where researchers map scholarship using formal methods to provide "spatial representation[s] among disciplines, fields, specialties, and individual papers (or authors)" (De Bellis, 2009, p. 142). In his overview of bibliometrics and citation analysis, Nicola De Bellis (2009) explained that mapping methods help to describe "the intellectual structure of a research area" by "tracing and evaluating the relative position and strength of the actors on a stage" and to empirically test "such abstract constructs as 'discipline,' 'specialty,' 'paradigm,' and 'scientific community'" (p. 142). In order to metaphorically map the terrain of technical communication as a discipline, we deploy the methods of co-citation network analysis, which we borrow from information sciences.

Co-citation analysis, first proposed by Henry Small (1973), explores the relationships between documents (or authors or journals) that are cited together in subsequent texts. By the time of Small's innovation in the 1970s, information science scholars had been studying bibliometric citations in order to evaluate the impact and importance of scientific literature for nearly two decades. Eugene Garfield's 1955 article "Citation Indexes for Science" had argued that an index of citations would better reflect knowledge production than subject heading indexes, which relied heavily (in the pre-digital print era) on a limited terminology for subjects developed by professional indexers. Citation indexes helped information science scholars to situate authors and texts within networks of

knowledge production and "to evaluate the significance of a particular work and its impact on the literature and thinking of the period" (Garfield, 1955, p. 109). Subsequent scholars began to analyze citations in terms of *networks*. Derek J. de Solla Price's (1965) influential work analyzed citation distribution in scientific papers, showing how "each group of new[ly published] papers is 'knitted' to a small, select part of the existing scientific literature but connected rather weakly and randomly to a greater part" (p. 149). That is, de Solla Price's analyses of citation networks showed that there was a body of work within the network of scientific literature that was heavily cited—"classic" literature—and the more "ephemeral" work that composed the majority of scientific literature but was not heavily cited (p. 149).

Citations (and, in our study's case, reading lists on syllabi), we contend, are important for understanding a discipline because they help to reveal how a discipline acknowledges a tradition and builds off this tradition. Citation analysis is not a new method to rhetoric and composition or technical communication scholars. Rhetoric and composition scholars have studied citation counts in *College Composition and Communication* (*CCC*) and *Rhetoric Society Quarterly* to explore disciplinary questions about composition studies (Detweiler, 2015; Goggin, 2000; Mueller, 2012; Phillips et al., 1993). Derek Mueller's (2012) work has perhaps been most influential: by graphing the frequency of authors cited in a 25-year span of *CCC* articles, he showed that rhetoric and composition has a "long tail" of cited scholars, which suggests that the field has become diffuse with disciplinary breadth and specializations, an aspect of the discipline that must be grappled with in graduate education (pp. 207-219). Technical and professional communication scholars have also turned to citation analysis in order to explore disciplinary status and the maturation of disciplinary journals (see Reinsch & Lewis, 1993; Reinsch & Reinsch, 1996). Smith's (2000a, 2004) work has perhaps been most ambitious, mapping technical communication through citation analysis and developing the field's major points of reference in scholarship in the 1980s and 1990s. Scholars like Smith, Mueller, and others have largely focused on citation counts of journals, authors, or texts in their citation analyses, and they have mostly relied on tables and bar, line, and plot graphs to visualize their data. Smith, whose citation analysis used percentages and comparisons of how frequently journals and serials were cited in the pages of technical communication journals, encouraged scholars to turn to other analytic methods to study citations and "map" connections (2000b, p. 175).

▉ Co-Citation Network Analysis as an Inventional Heuristic

In contrast to these approaches, we draw on co-citation network analysis to study texts assigned in graduate-level syllabi. Small's (1973) proposal was that studying co-citation networks might help to develop a more detailed map of a field than crude citation counting. As he wrote, "If it can be assumed that frequently cited

papers represent the key concepts, methods, or experiments in a field, then co-citation patterns can be used to map out in great detail the relationships between these key ideas" (pp. 265-266). Co-citation network analysis draws on the analytic methods of social network analysis in order "to trace the map of relationships among . . . key documents/key concepts, to outline and graphically visualize the structure of a research field, its connections with other fields, and its articulation into subfields and new research fronts" (De Bellis, 2009, p. xxvi). Social network analysis is comprised of a set of analytic strategies and theoretical approaches used to study the relationships of a set of "nodes" that are connected by links or "edges" (Barabási, 2002; Frith, 2014; Kadushin, 2012; Scott, 2012). Scholars in information and library science and in the digital humanities have analyzed citations using social network analysis, understanding citations as a form of network building (De Bellis, 2009; Healy, 2013; Otte & Rousseau, 2002; Wang, 2012). While citation network analysis has historically focused on citations in scholarly journals, Dan Wang (2012) proposed that studying syllabi instead of scholarship is helpful in exploring questions of disciplinarity for three reasons: 1) Unlike published scholarship, syllabi are meant to introduce the contours of a field to newcomers, 2) "syllabi offer insight into the courser divisions of a field because they are meant to summarize major research agendas," and 3) syllabi impact the development of a field "by forming consensus about the origin of ideas within a field" (p. 2).

Wang (2012) created a co-citation network of texts assigned in 52 syllabi from sociology courses to answer the question "Is there a canon in economic sociology?" Co-citation analysis explores the frequency of how often two texts or authors are cited together in later works. Whereas a traditional citation network includes *directed* edges from an article to a text it cites, a co-citation network creates an *undirected* edge between two texts if they are cited together. The motivations for using co-citation networks to study citations are that co-citation networks move us beyond crude citation counts (though these can be useful, as the studies cited above show) and allow us to visualize conversations or important topics in a field. Wang used a co-citation network in his study to calculate texts' relevance to the network: using algorithms to measure a text's authority (how often other texts linked to it) and status as a hub (how often it linked to texts with authority), Wang identified "a rather select canon of references in economic sociology" (2012, p. 4).

Of course, co-citation network analysis, like other quantitative approaches, risks flattening complex relationships (Frith, 2014; Fuhse & Mützel, 2011; Johnson, 2015). Just as there are a variety of reasons to cite a text in an article—to situate an argument, to build on the ethos of other scholars, to mark a claim as tentative (rather than a fact), to meet the perceived expectations of a journal editor or reviewers, to engage in-depth with another's ideas, and so forth (Cozzens, 1989)—there are many reasons to include a text on a syllabus: it may be foundational to a scholarly conversation, it may provide an example of a method or approach, it may be future-oriented and lay out a research agenda, it may provide a synthesis of research or perspectives to help orient students to a field, and so on.

A quantitative approach to citation network analysis ignores these complexities and particularities.

However, while social network analysis certainly risks missing nuance and context, it also provides a heuristic for researchers to invent and generate new questions. Mueller (2017) suggested that methods that map, graph, or otherwise visualize a field can serve as an inventional heuristic to raise questions about a field or discipline, providing "inventive and generative capacity" (p. 105). Co-citation network maps of the field can help us develop what Mueller called "network sense," "incomplete but nevertheless vital glimpses of an interconnected disciplinary domain focused on relationships that define and cohere widespread scholarly activity" (2017, p. 3). As Mueller explained, such maps can help scholars to recognize patterns in a field or discipline, "foster[ing] network sense" and offering us the opportunity to see a field differently and raise new questions about the field (p. 62). Thus, as we analyze data from our corpus and use graphs of our co-citation network, we use these visualizations to raise questions about texts and the field, attending to what Mueller and digital humanities scholar Matthew G. Kirschenbaum (2007) called "provocations," those "invitations to invent" that arise from data, rather than seeing the data as a form of "proof" about the field (Mueller, 2017, p. 4).

▌ Methods: Data Collection

To collect graduate-level syllabi for foundations courses in technical communication, we conducted a web search and requested syllabi through an IRB-approved process (protocol #505361 at Texas Tech). We searched the web pages or online course catalogs of 110 Ph.D., master's, and graduate certificate programs to see which programs offer graduate courses that provide students with a scholarly focused introduction to the field. We were ultimately looking for the types of courses that Johnson-Eilola and Selber (2001) identified as those that "provide new members of the field with a broad (if fluid) map that helps them develop new knowledge in the context of other knowledges" (p. 420). Thus, we were not interested in more specialized courses (e.g., rhetoric of health and medicine or publications management), courses that focused primarily on technical communication practices or genres, or practicum courses designed to cover the day-to-day teaching of technical or professional communication. Of the 110 programs we searched—a list we developed from Lisa Melonçon's (2009) and Dave Yeats and Isabelle Thompson's (2010) lists of programs and by searching additional programs we felt might include such a course—a maximum of 77 programs offer this type of course. This number is likely higher than actual offerings: course descriptions are often vague and many programs do not include syllabi online, so it was not always possible to tell if a graduate course titled something like "Introduction to Technical Communication" was more likely to be practice-based or to be more "three-dimensional," introducing students to the "thinking, doing, and teaching"

of technical communication (Johnson-Eilola & Selber, 2001, p. 415). To keep our dataset current, we limited syllabi that we would include to the eight-year period between Fall 2008 and Spring 2017.

We collected syllabi using three methods: 1) we searched the web for syllabi that had been posted publicly online; 2) we sent a request for syllabi out on disciplinary listservs and through our personal social media accounts (Facebook and Twitter); and 3) we emailed professors directly to request syllabi from programs that were not represented in our web search or initial public requests. Our requests explained that we were looking for graduate-level syllabi with titles such as Foundations of Technical Communication, Research and Theory in Technical/Professional Communication, and History of Technical Communication. We specified that we were looking for syllabi that included both a course description and reading list of assigned texts.

Our web search and solicitations resulted in a corpus of 60 syllabi from 45 institutions, representing 49 different courses taught by 56 different professors. Table 3.1 represents our search for syllabi and the results of that search. Our dataset represents 50 percent of programs we searched with a Ph.D. program and 33.9 percent of programs we searched that have a master's program or graduate certificate but no Ph.D. program. Eleven programs are represented twice in our dataset and two programs are represented three times because we received or found syllabi that we deemed substantially different. Five of these programs had two different courses that met our criteria (often one more theory focused and one more pedagogically focused). The other eight have one course, but we found or received two or three syllabi taught by different instructors. (One syllabus in our dataset is a course revision proposal.)

Table 3.2 shows the various foci of the courses based on the course titles. The variety of course titles reveals a lack of consensus on the name of the field: *technical* versus *professional* and *communication* versus *writing*. (While Sullivan and Porter (1993) argued for understanding professional and technical communication as different fields, with professional writing more aligned with humanism and English studies and technical writing more aligned with technical fields, Melonçon (2009) noted that "this distinction does not necessarily hold in terms of degree names," nor is it "one reflected in curriculum" (p. 138). Also, see Melonçon for a discussion of degree program names regarding "writing" versus "communication" and the inclusion of "rhetoric" in degree names.) Additionally, nine of the courses focused, at least in part, on teaching technical or professional communication/writing. Table 3.3 shows the programmatic locations of these courses: most of these courses were housed in English departments, though some courses were from engineering, humanities, interdisciplinary, or stand-alone technical communication programs. It is also worth noting that some programs do not have, or do not require, a foundations-style course. In Melonçon's (2009) study of master's programs, 62 percent required an introduction to the field of technical communication course, 7 percent offered the course as a concentration, and 1 percent offered the course as an elective.

Table 3.1. Number of programs we searched and numbers of programs, syllabi, courses, and instructors represented in our study

	Program type		Total
	Master's program or a graduate certificate in technical or professional writing (and no Ph.D. program)	**Ph.D. program in English, rhetoric, technical communication, or similar field**	
Programs searched	62	48	110
Programs that may have a foundations-style course	37	34	71
Programs included in our study	21	24	45
Number of syllabi from included programs	27	33	60
Courses represented in syllabi	23	26	49
Instructors represented in syllabi	24[a]	32	56

[a] *One syllabus from an M.A. program was a course revision proposal, so we did not attribute it to a specific instructor.*

Table 3.2. The foci of courses, based on course titles, in our study

Course focus based on the course title	**Number of syllabi represented**
Technical writing or communication (including prefixes like *foundations in*, *introduction to*, or *principles of*, and including terms like *theory, research, history*, or *practice*)	20
Professional writing or communication (including terms like *rhetoric, theory*, or *research*)	19
Professional and technical communication or writing (including terms like *theory* or *practice*)	5
Teaching technical communication or writing	3
Teaching professional writing (including terms like *theory*)	3
Teaching technical and professional writing (including terms like *theory* or *methods*)	2
Teaching business and technical writing	1
Other foci (these course titles usually affixed an additional key term to a title above, like *technology studies, scientific communication, writing studies*)	7
Total	60

Table 3.3. Program and institution types of courses represented in our study

Institution type (Carnegie Classification)	Program type	Number of institutions represented	Number of syllabi collected
Research institution (R1, R2, or R3)	Ph.D. in rhetoric and composition or rhetoric and writing (including listed as an emphasis or concentration) in an English department	14	18
	Ph.D. in English (emphasis or concentration not listed on program's website)	1	1
	Ph.D. in technical communication and rhetoric or rhetoric and professional communication (including listed as an emphasis or concentration) in an English department	5	9
	Ph.D. in engineering, interdisciplinary Ph.D. program, or other non-English field	3	4
	Ph.D. in technical communication in a technical communication department	1	1
	Master's in English (may have a technical communication graduate certificate)	4	4
	Master's in rhetoric and writing in a rhetoric and writing program	1	1
	Master's in technical or professional communication in an English department	3	4
	Master's in technical and/or professional communication in an interdisciplinary, engineering, or technical communication department	3	4
	Master's in communication in a communication department	1	1
Master's degree granting institutions	Master's in English or in writing in an English department	2	2
	Master's in technical and/or professional communication in an English department	3	6
	Master's in technical and/or professional communication in an interdisciplinary or technical communication department	3	4
Bachelor's degree granting institutions	Master's in writing in an English department	1	1
Total		45	60

Once syllabi were collected, all identifying information (like institution, instructor name, office hours, contact information, and similar information) was removed and syllabi were renamed "Syllabus A" through "Syllabus Z," and then doubling and then tripling letters (e.g., AA, BB, . . . AAA, BBB). With the help of students in Greg's 2015 graduate seminar, Foundations of Technical Communication, we entered each syllabus' assigned readings into a spreadsheet. The spreadsheet included columns for the following information:

- syllabus name (e.g., "Syllabus A")
- reading assigned
- the reading's original publication date
- the name of the anthology if the reading was a reprint or in an edited collection

We developed a scheme for entering the assigned readings into our spreadsheet so that our software (Gephi) would understand each entry of a reading as the same. When syllabi were unclear about the title of a reading, we were often able to make inferences about which text was assigned, and we occasionally contacted instructors to ask for clarification on an assigned text. We excluded texts from the spreadsheet that were listed as optional but included readings that were assigned to individual students. For example, if an instructor listed ten readings that she or he assigned to individual students to read and present on to the class, those texts were included in our data.

Readings were entered in the spreadsheet as *Author last name*, *First four words of the title*. In order to be consistent with these entries, we developed the following rules:

- Use sentence case for titles (only capitalizing first words and proper nouns).
- Use ampersands and Oxford commas when there were two or three authors.
- Use the first author's name and *et al.* without a comma if there were four or more authors.
- End titles before punctuation other than commas (e.g., colons and dashes).
- Remove prepositions, conjunctions, and articles from the end of excerpted titles.

So, for example, Miller's "A Humanistic Rationale for Technical Writing" was entered as "Miller, A humanistic rationale," and Slack, Miller, and Doak's "The Technical Communicator as Author: Meaning, Power, Authority" was entered as "Slack, Miller, & Doak, The technical communicator." Some texts required us to deviate from this practice. For example, Thralls and Blyer's "The Social Perspective and Pedagogy in Technical Communication" and "The Social Perspective and Professional Communication" would have resulted in the same node title. In this instance, we added two words—"and pedagogy" and "and professional," respectively. In other instances where confusion might arise, we added parenthetical years to the entry. We then proofread the spreadsheet to ensure consistently entered titles.

The 60 syllabi in our dataset assigned a total of 1,956 texts, averaging 32.6 texts per syllabus. The amount of reading assigned varied considerably: the syllabus with the most readings included 81 texts, eight syllabi assigned between 50 and 75 texts, ten assigned 40–49 texts, 11 assigned 30–39 texts, 15 assigned 20–29 texts, and the remaining 15 assigned fewer than 20 texts. One syllabus included only one required reading (Michael Hughes and George Hayhoe's *A Research Primer*) and had many readings listed as "to be announced." The 1,956 readings amounted to 978 unique texts (articles, book chapters, and monographs). The vast majority—720 of them— were assigned only once each. Of the remaining 258 texts, 103 were assigned in two syllabi, 46 were assigned three times, 33 were assigned four times, 41 were assigned five to ten times, 19 were assigned 11-15 times, and six were assigned 16 or more times.

▪ Methods: Creating the Co-Citation Network

To develop our co-citation network, we reorganized our data into a comma-separated values (CSV) file. Each line in this file represented a pair of readings that was assigned together on the same syllabus. For example, Syllabus A assigned 63 different texts. When this data was entered into our CSV file, data from Syllabus A resulted in 1,953 combinations of texts that were assigned together. The resulting CSV file for the whole dataset, which included 39,714 entries connecting co-cited texts, was then entered into Gephi, an open-source social networking analytic software.

Once in Gephi, we applied a variety of social network analytics to the dataset. Of particular importance to our study, we applied the following:

- Degree and weighted degree for texts in the network. A text's (or, in network terminology, a node's) degree in a co-citation network tells us how many other texts it was assigned with in the network. Its weighted degree tells us how frequently it was assigned along with those other texts (Scott, 2012). For example, Miller's "A Humanistic Rationale" was the most frequently assigned text in the dataset (assigned 35 times). In the co-citation network, it had a degree of 648, meaning it was assigned in syllabi along with 648 other texts. Its weighted degree was 1,273, meaning that it was assigned with the same texts multiple times (e.g., Miller's article was assigned with Katz's "The Ethic of Expediency" 21 times).

- Authority algorithms. In social network analysis, authority algorithms measure how important and influential a node is to a network. Authority algorithms (like Google's PageRank) measure a node's importance based on the importance of the other nodes it's connected to. These algorithms calculate authority by analyzing the link or edge structure of a network, determining authority through recursively analyzing the data (Kadushin, 2012; Wang, 2012). To determine a text's authority, we used Jon M. Kleinberg's (1999) Hypertext Induced Topic Selection (HITS) algorithm in Gephi.

- Community detection algorithms. Community detection algorithms determine "communities" or subgraphs within a network. In Gephi, we used

Vincent D. Blondel et al.'s (2008) modularity class algorithm to determine "sub-units or communities, which are sets of highly interconnected nodes" (p. 2) in the co-citation network. Using a community detection algorithm allowed us to see if groups of texts seemed to be assigned together quite frequently, and to speculate if there are "conversations" or common areas of interest or topics in the dataset.

The Co-Citation Network and Authoritative Texts in Technical Communication

The resulting co-citation network is visualized in Figure 3.1. Because this co-citation network is quite large (978 texts, or nodes, connected by 31,936 edges, or links), we have applied a filter to the visualization to make it more legible and less cluttered. Figure 3.1 displays nodes only if they have an edge weight of at least two (that is, they were assigned together at least twice) and consequently only displays 247 of the 978 texts in the network.
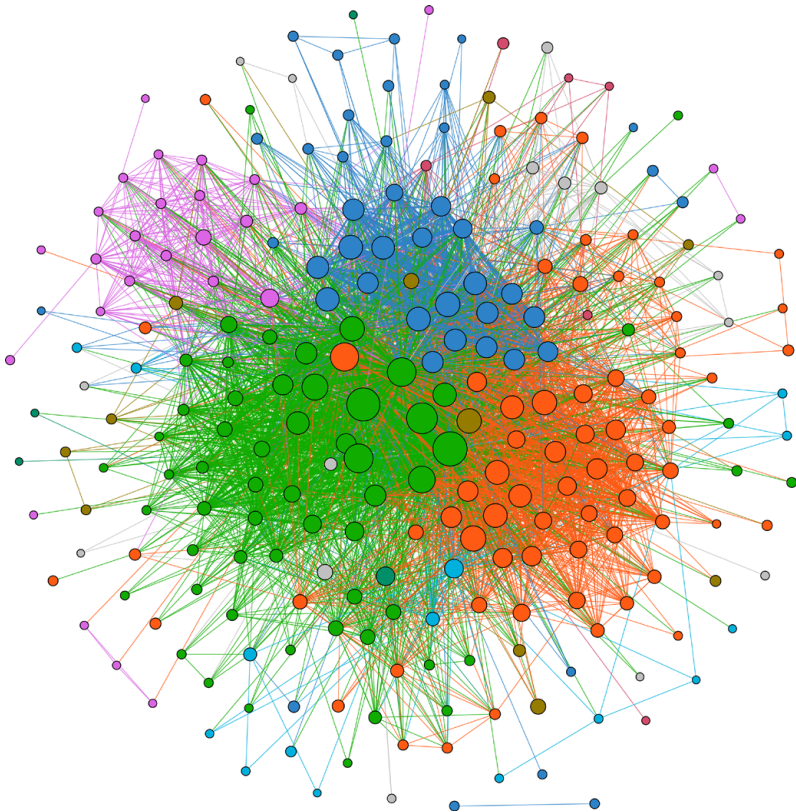

Figure 3.1. The co-citation network for our dataset, filtered to show nodes only if they have an edge weight of at least two. Different colors represent different modularity classes, and node size is larger if the text has more authority in the network.

While this graph is still visually busy, making it difficult to say too much about it without turning to analytic data, it does provide a high-level "map" of the discipline that allows us to quickly observe a few takeaways: First, many texts in the dataset are assigned together infrequently, resulting in many texts on the edges of this visualization that aren't as central or authoritative. Second, there does appear to be a group of texts that are more authoritative to the network than others. And third, some texts are assigned together quite frequently, and some communities of text seem to have emerged in this network. Figure 3.2 provides a more focused visualization of the co-citation network, showing just the 102 most authoritative texts in the network that were assigned in at least four syllabi in the dataset. In Figure 3.2 and Table 3.4, we chose to include only texts that were assigned by at least four syllabi because we wanted to mitigate the influence of some syllabi that assigned many different texts. One limitation of using HITS authority algorithms (and other algorithms as well that measure authority, centrality, or influence) is that syllabi that assign more texts have more influence on the co-citation network than syllabi that assign fewer texts. For example, Yrjö Engeström's "Activity Theory and Individual and Social Transformation" and Clay Spinuzzi's *Network* both have strong HITS authority scores but were only assigned on two syllabi each. They earned high authority scores in the algorithm because they were assigned along with many other texts that were assigned frequently in the network: a syllabus with 75 readings assigned both texts; another with 81 readings (the most in the dataset) assigned Engeström's chapter; and a third that assigned *Network* had 52 readings. Consequently, we decided to include only texts that were assigned by at least four syllabi in Figure 3.2 and Table 3.4.

Table 3.4 provides a list of these 102 texts, along with their original publication date and whether they were included in Smith's (2000a) list of 163 points of reference for the field and her subsequent (2004) list of 26 points of reference. Notably, only 21 of these 102 texts were in Smith's (2000a) list of 163 points of reference. And of the 26 texts Smith (2004) listed in her more "magnified view" (p. 53) of the field, only nine continue in our list. If our sampling of graduate-level syllabi is any indication, the field has changed in the two decades since Smith's citation analyses. (We speculate on reasons why later in this chapter.) But also, a few texts have remained quite central to the field over the years. For instance, 35 of the 60 syllabi we collected assigned Miller's "A Humanistic Rationale," and it is the most authoritative text in the co-citation network. The status of Miller's essay in this network is unsurprising: Smith's (1997) analysis of intertextual connections to "A Humanistic Rationale" showed just how influential the essay was to knowledge creation in the field. Scholars in technical communication would likely express no surprise at other texts that have also remained central to the field since the late 1990s. For example, Rob-

ert Connors' essay, "The Rise of Technical Writing Instruction in America," has been influential in understanding the history of technical communication instruction. Articles by the likes of David Dobrin, Stephen Katz, Carolyn R. Miller, Cezar Ornatowski, Russell Rutter, and Dale Sullivan have also shaped the field's views of the rhetorical and ethical aspects of technical communication. Johnson-Eilola's and Slack, Miller, and Doak's articles have influenced how we understand the role of technical communicators as knowledge workers. And Doheny-Farina's, Selzer's, and Winsor's studies of workplace writing helped to shift the field's attention from pedagogy to the contexts of writing in professional settings.
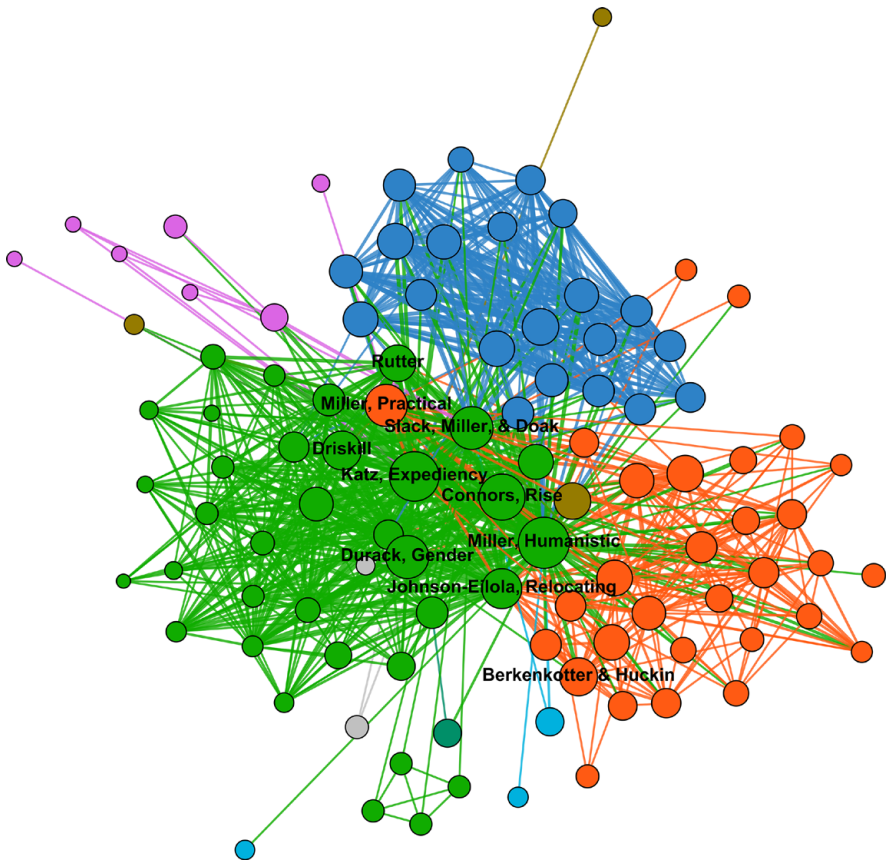

Figure 3.2. The co-citation network for our dataset, filtered to show the 102 most authoritative texts in the network that were also assigned in at least four syllabi. Different colors represent different modularity classes, and node size is larger if the text has more authority in the network. The ten most authoritative texts in the network are labeled.

Table 3.4. The 102 most authoritative texts that were assigned at least four times in our dataset, ranked by HITS authority score (Kleinberg, 1999)

| Rank by HITS authority score | | | | | |
In entire data-set	In sub-graph without *SPTC*ᵃ	Text (original publication year)	Times assigned in dataset	In Smith's (2000a) list of 163 texts	In Smith's (2004) list of 26 texts
1	1	Miller, A humanistic rationale (1979)	35	x	x
2	2	Katz, The ethic of expediency (1992)	28	x	x
3	3	Connors, The rise of technical (1982)	23	x	
4	4	Durack, Gender, technology (1997)	16		
5	7	Slack, Miller, & Doak, The technical communicator (1993)	22	x	
6	8	Miller, What's practical about technical (1989)	14	x	x
7	15	Johnson-Eilola, Relocating the value (1996)	17		
8	5	Driskill, Understanding the writing context (1989)	11		
9	10	Berkenkotter & Huckin, Re-thinking genre (1993)	9		
10	11	Rutter, History, rhetoric, and humanism (1991)	15	x	
11	-	Hart-Davidson, What are the work (2013)	14		
12	18	Miller, Genre as social action (1984)	8	x	
13	9	Allen, The case against defining (1990)	13		
14	-	Mirel, How can technical communicators () 2013	13		
15	16	Breuch, Thinking critically about technological (2002)	9		
16	13	Moore, Myths about instrumental discourse (1999)	6		
17	*	Selfe & Selfe, What are the boundaries (2013)	14		
18	6	Dobrin, What's technical about technical (1983)	15	x	x

Rank by HITS authority score					
In entire data-set	In sub-graph without *SPTC*[a]	Text (original publication year)	Times assigned in dataset	In Smith's (2000a) list of 163 texts	In Smith's (2004) list of 26 texts
19	–	Ceraso, How can technical communicators (2013)	11		
20	47	Blakeslee, Bridging the workplace (2001)	8		
21	*	Porter, How can rhetoric theory (2013)	14		
22	–	Schriver, What do technical communicators (2013)	12		
23	14	Johnson, Audience involved (1997)	12		
24	22	Redish, What is information design (2000)	7		
25	–	Spinuzzi, How can technical communicators (2013)	10		
26	–	Cargile Cook et al., How can technical communicators (2013)	9		
27	–	Scott, How can technical communicators (2013)	8		
28	–	Henry, How can technical communicators (2013)	10		
29	17	Selzer, The composing process (1983)	12	x	x
30	31	Rude, Mapping the research questions (2009)	11		
31	59	Lay, Feminist theory (1991)	9	x	
32	–	St.Amant, What do technical communicators (2013)	8		
33	–	Burnett, Cooper, & Welhausen, What do technical communicators (2013)	11		
34	40	Freedman & Adam, Learning to write professionally (1996)	8		
35	*	Henze, What do technical communicators (2013)	11		
36	–	Blakeslee & Savage, What do technical communicators (2013)	9		

Rank by HITS authority score					
In entire data-set	In sub-graph without *SPTC*[a]	Text (original publication year)	Times assigned in dataset	In Smith's (2000a) list of 163 texts	In Smith's (2004) list of 26 texts
37	-	Longo & Fountain, What can history teach (2013)	8		
38	38	Johnson, Complicating technology (1998)	6		
39	34	Thrush, Multicultural issues in technical (1997)	6		
40	48	Mirel, Advancing a vision (2002)	8		
41	50	Winsor, Engineering writing (1990)	10		
42	-	Wysocki, What do technical communicators (2013)	7		
43	20	Barton & Barton, Ideology and the map (1993)	15		
44	45	Bernhardt, Teaching for change, vision (1995)	6		
45	-	Johnson-Eilola & Selber, Introduction(2013)	10		
46	53	Kramer & Bernhardt, Teaching text design (1996)	7		
47	-	Mehlenbacher, What is the future (2013)	8		
48	23	Cargile Cook, Layered literacies (2002)	9		
49	55	Johnson, Johnson responds (1999)	4		
50	60	Johnson, User-centered technology (1998)	10[b]		
51	-	Swarts, How can work tools (2013)	8		
52	35	Selber, Beyond skill building (1994)	7		
53	43	Carliner, Computers and technical communication (2009)	5		
54	67	Jackson, The rhetoric of design (2000)	4		
54	67	Fukuoka, Kojima, & Spyridakis, Illustrations in user manuals (1999)	4		

| Rank by HITS authority score | | | | | |
In entire data-set	In sub-graph without *SPTC*[a]	Text (original publication year)	Times assigned in dataset	In Smith's (2000a) list of 163 texts	In Smith's (2004) list of 26 texts
56	51	Ornatowski, Between efficiency and politics (1992)	8	x	
57	74	Gurak & Bayer, Making gender visible (1994)	4		
58	61	Herndl, Teaching discourse and reproducing (1993)	5		
59	32	Wilson & Herndl, Boundary objects as rhetorical (2007)	4		
60	82	Spilka, Communicating across organizational boundaries (1995)	4		
61	83	Russell, The ethics of teaching (1993)	4	x	
61	83	Porter, The exercise of critical (1998)	4		
63	-	Dicks, How can technical communicators (2013)	7		
64	12	Sullivan, Political-ethical implications (1990)	10	x	x
65	*	Spinuzzi, Pseudotransactionality, activity theory (1998)	5		
66	29	Bernhardt, The shape of text (1993)	9		
67	*	Selber, Johnson-Eilola, & Selfe, Contexts for faculty professional (1995)	4		
68	36	Sullivan & Porter, On theory, practice (1998)	11		
69	52	Zoetewey & Staggers, Teaching the Air Midwest (2004)	5		
70	42	Bitzer, The rhetorical situation (1968)	4		
71	65	Spilka, Orality and literacy (1990)	4		
72	28	Dubinsky, Becoming user-centered, reflective practitioners (2004)	4		
73	*	Moses & Katz, The phantom machine (2006)	4		

Rank by HITS authority score					
In entire data-set	In sub-graph without *SPTC*[a]	Text (original publication year)	Times assigned in dataset	In Smith's (2000a) list of 163 texts	In Smith's (2004) list of 26 texts
74	39	Selfe & Selfe, The politics (1994)	9		
75	24	Blakeslee, Addressing audiences (2009)	4		
75	24	Salvo & Rosinsky, Information design (2009)	4		
75	24	Thatcher, Understanding digital literacy (2009)	4		
78	21	Thralls & Blyler, The social perspective and professional (1993)	9		
79	27	Clark, Shaped and shaping tools (2009)	4		
80	58	Rude, The report for decision (1995)	8		
81	*	Paradis, Text and action (1991)	7	x	
82	*	Henry, Writing workplace cultures (2001)	4		
83	*	Selfe & Hawisher, A historical look (2002)	4		
84	88	Thralls & Blyler, The social perspective and pedagogy (1993)	7		
85	30	Charney, Empiricism is not (1996)	11		
86	62	Doheny-Farina, Writing in an emerging (1986)	8	x	x
87	44	Longo, *Spurious coin* (2000)	4		
88	63	MacKinnon, Becoming a rhetor (1993)	4	x	
89	41	Brasseur, Contesting the objectivist paradigm (1993)	6		
90	85	Wolfe, How technical communication textbooks (2009)	6		
91	*	Hallenbeck, User agency, technical communication (2012)	5		
92	*	Howard, Who "owns" electronic texts (1996)	6		
93	75	Dragga & Voss, Cruel pies (2001)	4		

| Rank by HITS authority score | | | | | |
In entire data-set	In sub-graph without *SPTC*[a]	Text (original publication year)	Times assigned in dataset	In Smith's (2000a) list of 163 texts	In Smith's (2004) list of 26 texts
94	37	Allen et al., What experienced collaborators say (1987)	5	x	x
95	*	Grabill & Simmons, Toward a critical rhetoric (1998)	4		
96	72	Bosley, Cross-cultural collaboration (1993)	7	x	
97	*	Harrison, Frameworks for the study (1987)	4	x	
98	*	Anson & Forsberg, Moving beyond the academic (1990)	4	x	
99	*	Katz, Writing review (1998)	4		
100	*	Foss, Foss, & Trapp, Perspectives on the study (1985)	4		
101	*	Faigley, Nonacademic writing (1985)	5	x	x
102	*	Mirel, Writing and database technology (1996)	4		

[a] *Texts no longer in the network when syllabi that assigned* Solving Problems in Technical Communication (SPTC) *were removed are marked with a (–) and texts ranking below 100th are marked with (*).*

[b] *Johnson's* User-Centered Technology *(or chapters from it) was assigned in seven syllabi, and his chapter reprinted in Peeples's (2003) PWR was assigned in three syllabi.*

Also notable in Table 3.4 is the presence of every chapter and the introduction from Johnson-Eilola and Selber's (2013) *Solving Problems in Technical Communication* (*SPTC*). Because of the dominance in the co-citation network of this relatively new collection, which "is for students who are learning about the field" (p. 1) and synthesizes scholarship in the field for new practitioners, we included a column in Table 3.4 that lists texts' authority ranking if syllabi that assigned *SPTC* were excluded from the network. Since *SPTC* was published recently, it may have been assigned frequently because teachers are testing out the book; it has not yet passed the test of time, and a reproduction of this study in a few years might find that the book has fallen off of syllabi. Another possibility is that professors are using this collection because of the chapters' strong synthesis of prior scholarship. Not only do the authors provide useful overviews of research and helpful heuristics, but they also model how scholarship can deploy literature reviews to do intellectual work. Fifteen of the 60 syllabi assigned *SPTC*, so the co-citation network is different if these syllabi are excluded: chapters from *SPTC*

become less authoritative or aren't in the network at all (a few syllabi didn't assign *SPTC* but did assign photocopies of scans of a few chapters). Indeed, anthologies like *SPTC* and *CWTC* have quite a strong influence on this co-citation network—and consequently on graduate education in the field, as we address in the next section.

Communities in the Co-Citation Network and the Influence of Anthologies

As we mentioned in the previous section, we applied community detection algorithms (Blondel et al., 2008) to the co-citation network, hoping to learn if there were subsets of the co-citation network that might reveal "communities" within the field or perhaps even differing views of the field. For example, if many communities were detected that revealed complete separate sets of texts not connected to the rest of the graph, this would tell us that the field is rather disperse with little shared understanding of what shared texts constitute the field's "transmit" (Toulmin, 1972; Smith, 2004). Or, if communities were detected that seemed to be heavily connected to each other (usually through texts that served as hubs) but with quite a few texts not linked to each other, this would tell us that there was a core set of texts that the field largely shares but quite disperse ways of approaching the field outside of those texts. And potentially, these communities could tell us, based on the texts in the community, something about ways teachers of graduate courses understand the network of the field.

The latter of these two potential findings proved true: we identified 16 communities in the co-citation network, most of which were highly connected to each other, and interestingly, the community detection algorithm highlighted the influence of anthologies on this co-citation network (and thus, on graduate education in the field). Five anthologies or collections proved to be particularly influential: Johnson-Eilola and Selber's (2004) *CWTC* was assigned in 16 syllabi; their (2013) *SPTC* was assigned in 15 syllabi; James Dubinsky's (2004) *Teaching Technical Communication* (*TTC*) was assigned 11 times; J. Blake Scott, Bernadette Longo, and Katherine V. Wills' (2006) *Critical Power Tools: Technical Communication and Cultural Studies* (*CPT*) was assigned 5 times; and Tim Peeples' (2003) *Professional Writing and Rhetoric* (*PWR*) was assigned by 4 syllabi. A sixth collection, Rachel Spilka's (2009) *Digital Literacy for Technical Communication,* was also somewhat influential, as it was required in three syllabi, and some other syllabi assigned scans or photocopies from particular chapters. Some syllabi required more than one of these books; some listed them as suggested readings or books to own; and some listed assigned readings in ways that made it clear that texts were scanned or photocopied from these books (rather than provide the original when they were reprinted in these anthologies or collections).

The community detection algorithm reveals just how powerful anthologies and collections are in shaping how graduate courses transmit the field

to graduate students. The algorithm detected 16 different communities in the network (based on the defaults of the algorithm in Gephi; admittedly, changing these defaults would detect smaller, and thus more, or larger, and thus fewer, communities). Some of these communities were small—a collection of texts assigned in only one syllabus. But others were quite large and centered around either these anthologies and collections (and texts assigned along with them) or around some central approaches in the field. Table 3.5 lists the major communities in the network along with the central topics and representative texts in the field.

Table 3.5. Communities in the co-citation network[a]

Color in Figures 3.1 & 3.2 (size)	Topics & description	Representative or notable texts
Blue (172 texts)	Johnson-Eilola & Selber's (2013) *SPTC*	Chapters from *SPTC*
Orange (164 texts)	Dubinsky's (2004) *TTC* and portions of Scott et al.'s (2006) *CPT*	Most chapters from *TTC* and *CPT* Cargile Cook, "Layered Literacies" Wilson & Herndl, "Boundary Objects as Rhetorical" Zoetewey & Staggers, "Teaching the Air Midwest"
Green (129 texts)	Johnson-Eilola & Selber's (2004) *CWTC* and Spilka's (2009) *Digital Literacy*	All chapters from *CWTC* and some chapters from Spilka's *Digital Literacy* Note: Chapters that were reprinted in both *CWTC* and either *TTC* or *PWR* were in this community.
Purple (73 texts)	Peeples' (2003) *PWR*	Most chapters from *PWR*
Brownish-Green (71 texts)	Rhetorical theory and method	Miller, "Genre as Social Action" Engeström, "Activity Theory and Individual" Ong, "The Writer's Audience" MacKinnon, "Becoming a Rhetor" Dragga & Voss, "Cruel Pies" Diehl et al., "Grassroots" Dicks, "Cultural Impediments to Understanding" Locker, "Will Professional Communication be" Bazerman, *Shaping Written Knowledge* Faber, "Professional Identities" Graham & Whalen, "Mode, Medium, and Message"

Color in Figures 3.1 & 3.2 (size)	Topics & description	Representative or notable texts
Sky Blue (62 texts)	Technology, methodology, and curriculum	Johnson, *User-Centered Technology* Longo, *Spurious Coin* Wolfe, "How Technical Communication Textbooks" Melonçon & Henschel, "Current State of U.S." Buchanan, "Declaration by Design" Potts, *Social Media in Disaster* Simmons & Zoetewey, "Productive Usability" Blakeslee, "The Technical Communication Research" Sullivan & Porter, *Opening Spaces* Porter & Sullivan, "Remapping Curricular Geography" Johnson et al., "User-Centered Technology in Participatory" Sullivan & Porter, "Remapping Curricular Geography" Palmeri, "Disability Studies, Cultural Analysis" Teston, "Moving from Artifact"
Red (53 texts)	Rhetoric: Methods, audience, and authorship	Ede & Lunsford, "Audience Addressed" Hughes & Hayhoe, *A Research Primer* Ornatowski, "Technical Communication and Rhetoric" Coney, "The Implied Author" Redish, "Understanding People" Coney, "Technical Communication Theory"
Dark green (51 texts)	Miscellaneous texts	Carliner, "Computers and Technical Communication"
Gray (34 texts)	Rhetoric and cultural studies, including chapters from *CPT*	Bitzer, "The Rhetorical Situation" Hellenbeck, "User Agency, Technical Communication" Chapters from *CPT*

ᵃ Modularity class determined by Blondel et al.'s (2008) algorithm. Communities that represent texts assigned only once or twice are excluded from this list.

One reason, then, that the list of the 102 most authoritative texts differs from Smith's (2000a) 163 points of reference in the field is because of the influence of these anthologies and collections. The publication of collections like *CWTC* and *TTC* made accessing and assigning texts easier, and the editors of these collections have likely had a strong hand in shaping what the field considers foundational texts. In this way, editors serve as what Maureen Daly Goggin (2000) called "discipliniographers," or those who help to write the discipline through their authority and role in publishing processes (p. 148). For instance, Jo

Allen's "The Case Against Defining Technical Communication," first published in 1990, is authoritative in our network but is not in Smith's (2000a) list, likely because Dubinsky (2004) chose to anthologize the essay in *TTC*. Ben Barton and Marthalee Barton's 1993 "Ideology and the Map" serves as a similar case: not in Smith's (2000a) list of points of reference but frequently assigned in these graduate courses because of its inclusion in *CWTC*.

These discipliniographers have been so influential on graduate courses in our dataset that, of the 102 most authoritative texts in the network listed in Table 3.4, all but ten of the texts were reprinted or originally published in one of the six collections listed previously. Two of these texts have been central to rhetorical theory more broadly: Miller's (1984) "Genre as Social Action" and Lloyd Bitzer's (1968) "The Rhetorical Situation." Four of these texts are from the first few years of the 21st century, published just before or as most of these anthologies were published: Kelli Cargile Cook's (2002) "Layered Literacies," Meredith Zoetewey and Julie Staggers' (2004) "Teaching the Air Midwest," Longo's (2000) *Spurious Coin*, and Sam Dragga and Dan Voss' (2001) "Cruel Pies." (We count Robert Johnson's 1998 *User-Centered Technology* as reprinted in these anthologies because one of the chapters was reprinted in *PWR*.) Only four articles in Table 3.4 were published after 2006 (except those from Spilka, 2009): Carolyn Rude's (2009) "Mapping the Research Questions," Greg Wilson and Carl Herndl's (2007) "Boundary Objects," Joanna Wolfe's (2009) "How Technical Communication Textbooks," and Sarah Hallenbeck's (2012) "User Agency." Likely in part because of the influence of anthologies in this dataset, the foundational texts in the field skew toward the 1980s, 1990s, and early 2000s.

Table 3.6 in the next section provides our updated list of points of reference for the field based on our dataset. We don't intend this list to be definitive, but rather a tentative list of texts that are influential on the field and are seen by teachers and publishers as important to transmit to graduate students entering the field. Table 3.6 also includes the publication locations of these texts based on the source of the text in teachers' syllabi, showing just how influential collections—especially *CWTC* and *TTC*—are on the field. For example, while the original printing of Miller's "A Humanistic Rationale" was in *College English*, it was most frequently assigned from *CWTC* or *TTC*. (Sometimes it was unclear what the source of a text was when it was assigned, so we included that as "unknown" in the final column of Table 3.6.)

The Field's Coherence and Diffusion: Toward Points of Reference in Technical Communication

While a vast number of texts in our dataset were assigned only once—720 of them, in fact—we want to propose that the core set of authoritative texts suggests that the field of technical communication has developed some coherence. As social network scholars have argued, most social networks are structured with a "long tail," meaning that a network is often structured around a few highly con-

nected nodes and many nodes that are less connected (Anderson, 2004; Barabási, 2002; Kadushin, 2012; Mueller, 2012). In his study of citations in *CCC*, Mueller (2012) expressed concern that a long tail of cited authors might represent a diffuse field in rhetoric and composition with many different specializations and conversations. As he noted, one can see the discipline as coherent by focusing on the heavily cited authors in rhetoric and composition, or see a diffuse field by focusing on the long tail. It is only by looking at the relationship between heavily cited texts and the long tail that one can begin to describe the field. While Mueller took a diachronic approach to see how citation patterns in *CCC* shifted over time, we turn to social network analytics—particularly authority and community detection—to help us explore the relationships between texts in the network.

We don't automatically share anxieties that technical communication is diffuse based solely on the presence of a long tail in this network. For one, this distribution is typical of networks. But more specifically, a long tail makes sense: instructors might include a text on a syllabus for a variety of reasons, leading to numerous texts not shared across the dataset. An article could be assigned because it provides an example of a theoretical approach, not because it is foundational to the field. Additionally, instructors will have different theoretical or methodological approaches. For example, one syllabus assigned historical textbooks from the 19th and 20th centuries—ones not assigned by anyone else. Another syllabus is heavier on critical theory, assigning Althusser, Foucault, and Derrida, theorists not included in other syllabi. Further, some instructors might be exemplifying approaches through working on shared projects that require readings they wouldn't assign in another iteration of the course. Thus, we are not so concerned about the presence of a long tail in this network.

Most citation analyses in technical communication and in rhetoric and composition have focused on citation counts, asking which authors, texts, or journals are most frequently cited in a corpus of scholarship (Detweiller, 2015; Goggin, 2000; Mueller, 2012; Phillips et al., 1993; Reinsch & Lewis, 1993; Reinsch & Reinsch, 1996; Smith, 2000a, 2000b, 2004). Citation counts are useful for determining which texts are cited most frequently (or assigned most frequently in our dataset), but do not tell us much about how central or authoritative these texts are to the network. That is, citation counts do little to tell us about how a text is situated *in relation* to the rest of the network. Social network analytics—like authority algorithms—can provide us data that tells us how central or authoritative a text is in a network.

Table 3.6 lists our points of reference for technical communication in graduate education. This list is based on Table 3.4, removing chapters from *SPTC* and listing the 82 most authoritative texts in the co-citation network that were assigned at least four times. We have provided the full citation for each text (citations for other texts we mention in the dataset but that aren't listed in Table 3.6 are provided in the appendix). As we observed previously, collections and anthologies are highly influential on this list.

Table 3.6. An updated list of 82 points of reference in technical communication and their publication locations in the dataset

Text	*CWTC* 2004	*TTC* 2004	*CPT* 2006	*PWR* 2003	Original, elsewhere, or unknown
Allen, Jo. (1990). The case against defining technical communication. *Journal of Business and Technical Communication, 4*(2), 68-77. https://doi.org/10.1177/105065199000400204	-	7	-	-	6
Allen, Nancy, Atkinson, Dianne, Morgan, Meg, Moore, Teresa, & Snow, Craig. (1987). What experienced collaborators say about collaborative writing. *Journal of Business and Technical Communication, 1*(2), 70-90. https://doi.org/10.1177/105065198700100206	5	-	-	-	-
Anson, Chris M., & Forsberg, L. Lee. (1990). Moving beyond the academic community: Transitional stages in professional writing. *Written Communication, 7*(2), 200-231. https://doi.org/10.1177/0741088390007002002	-	-	-	3	1
Barton, Ben F., & Barton, Marthalee S. (1993). Ideology and the map: Toward a postmodern visual design practice. In Nancy Roundy Blyler & Charlotte Thralls (Eds.), *Professional communication: The social perspective* (pp. 49-78). Sage.	10	-	-	-	5
Berkenkotter, Carol, & Huckin, Thomas N. (1995). Rethinking genre from a sociocognitive perspective. In *Genre knowledge in disciplinary communication: Cognition/culture/power* (pp. 1-25). Lawrence Earlbaum.	-	7	-	-	2
Bernhardt, Stephen A. (1993). The shape of text to come: The texture of print on screens. *College Composition and Communication, 44*(2), 151-175. https://doi.org/10.2307/358836	7	-	-	2	-
Bernhardt, Stephen A. (1995). Teaching for change, vision, and responsibility. *Technical Communication, 42*(4), 600-602.	-	6	-	-	-
Bitzer, Lloyd F. (1968). The rhetorical situation. *Philosophy & Rhetoric, 1*(1), 1-14.	-	-	-	-	4
Blakeslee, Ann M. (2001). Bridging the workplace and the academy: Teaching professional genres through classroom–workplace collaborations. *Technical Communication Quarterly, 10*(2), 169-192. https://doi.org/10.1207/s15427625tcq1002_4	-	7	-	-	1

Text	CWTC 2004	TTC 2004	CPT 2006	PWR 2003	Original, elsewhere, or unknown
Blakeslee, Ann M. (2009). Addressing audiences in a digital age. In Rachel Spilka (Ed.), *Digital literacy for technical communication: 21st century theory and practice* (pp. 199-229). Routledge.	-	-	-	-	4
Bosley, Deborah S. (1993). Cross-cultural collaboration: Whose culture is it anyway? *Technical Communication Quarterly, 2*(1), 51-62. https://doi.org/10.1080/10572259309364523	6	-	-	-	1
Brasseur, Lee E. (1993). Contesting the objectivist paradigm: Gender issues in the technical and professional communication curriculum. *IEEE Transactions on Professional Communication, 36*(3), 114-123. https://doi.org/10.1109/47.238051	5	-	-	-	1
Breuch, Lee-Ann Kastman. (2002). Think-ing critically about technological literacy: Developing a framework to guide computer pedagogy in technical communication. *Techni-cal Communication Quarterly, 11*(3), 267-288. https://doi.org/10.1207/s15427625tcq1103_3	9	-	-	-	-
Cargile Cook, Kelli. (2002). Layered literacies: A theoretical frame for technical communi-cation pedagogy. *Technical Communication Quarterly, 11*(1), 5-29. https://doi.org/10.1207/s15427625tcq1101_1	-	-	-	-	9
Carliner, Saul. (2009). Computers and tech-nical communication in the 21st century. In Rachel Spilka (Ed.), *Digital literacy for technical communication: 21st century theory and practice* (pp. 21-50). Routledge.	-	-	-	-	5
Charney, Davida. (1996). Empiricism is not a four-letter word. *College Composition and Communication, 47*(4), 567-593. https://doi.org/10.2307/358602	10	-	-	-	1
Clark, Dave. (2009). Shaped and shaping tools: The rhetorical nature of technical communication technologies. In Rachel Spilka (Ed.), *Digital liter-acy for technical communication: 21st century theory and practice* (pp. 85-102). Routledge.	-	-	-	-	4
Connors, Robert J. (1982). The rise of technical writing instruction in America. *Journal of Technical Writing and Communication, 12*(4), 329-352.	13	7	-	-	4[a]

Text	CWTC 2004	TTC 2004	CPT 2006	PWR 2003	Original, elsewhere, or unknown
Dobrin, David N. (1983). What's technical about technical writing? In Paul V. Anderson, R. John Brockman, & Carolyn R. Miller (Eds.), *New essays in technical and scientific communication: Research, theory, practice* (pp. 227-250). Baywood.	10	2	-	-	3
Doheny-Farina, Stephen. (1986). Writing in an emerging organization: An ethnographic study. *Written Communication, 3*(2), 158-185. https://doi.org/10.1177/0741088386003002002	6	-	-	-	2
Dragga, Sam, & Voss, Dan. (2001). Cruel pies: The inhumanity of technical illustrations. *Technical Communication, 48*(3), 265-274.	-	-	-	-	4
Driskill, Linda. (1989). Understanding the writing context in organizations. In Myra Kogen (Ed.), *Writing in the business professions* (pp. 125-145). National Council of Teachers of English.	6	-	-	4[b]	2
Dubinsky, James. M. (2004). Becoming user-centered, reflective practitioners. In James. M. Dubinsky (Ed.), *Teaching technical communication: Critical issues for the classroom* (pp. 1-10). Bedford/St. Martin's.	-	4	-	-	-
Durack, Katherine T. (1997). Gender, technology, and the history of technical communication. *Technical Communication Quarterly, 6*(3), 249-260. https://doi.org/10.1207/s15427625tcq0603_2	11	3	-	-	2
Faigley, Lester. (1985). Nonacademic writing: The social perspective. In Lee Odell & Dixie Goswami (Eds.), *Writing in nonacademic settings* (pp. 231-248). The Guilford Press.	-	-	-	3	2
Foss, Sonja K., Foss, Karen A., & Trapp, Robert. (1985). Perspectives on the study of rhetoric. In *Contemporary perspectives on rhetoric* (pp. 1-10). Waveland Press.	-	-	-	4	-
Freedman, Aviva, & Adam, Christine. (1996). Learning to write professionally: "Situated learning" and the transition from university to professional discourse. *Journal of Business and Technical Communication, 10*(4), 395-427. https://doi.org/10.1177/1050651996010004001	-	8	-	-	-

Text	CWTC 2004	TTC 2004	CPT 2006	PWR 2003	Original, elsewhere, or unknown
Fukuoka, Waka, Kojima, Yukiko, & Spyridakis, Jan H. (1999). Illustrations in user manuals: Preference and effectiveness with Japanese and American readers. *Technical Communication, 46*(2), 167-176.	-	4	-	-	-
Grabill, Jeffrey T., & Simmons, W. Michelle. (1998). Toward a critical rhetoric of risk communication: Producing citizens and the role of technical communicators. *Technical Communication Quarterly, 7*(4), 415-441. https://doi.org/10.1080/10572259809364640	-	-	-	2	2
Gurak, Laura J., & Bayer, Nancy L. (1994). Making gender visible: Extending feminist critiques of technology to technical communication. *Technical Communication Quarterly, 3*(3), 257-270. https://doi.org/10.1080/10572259409364571	-	4	-	-	-
Hallenbeck, Sarah. (2012). User agency, technical communication, and the 19th-century woman bicyclist. *Technical Communication Quarterly, 21*(4), 290-306. https://doi.org/10.1080/10572252.2012.686846	-	-	-	-	5
Harrison, Teresa M. (1987). Frameworks for the study of writing in organizational contexts. *Written Communication, 4*(1), 3-23. https://doi.org/10.1177/0741088387004001001	4	-	-	-	-
Henry, Jim. (2001). Writing workplace cultures. *College Composition and Communication, 53*(2). https://library.ncte.org/journals/CCC/issues/v53-2	-	-	2	-	2
Herndl, Carl G. (1993). Teaching discourse and reproducing culture: A critique of research and pedagogy in professional and non-academic writing. *College Composition and Communication, 44*(3), 349-363. https://doi.org/10.2307/358988	4	-	-	-	1
Howard, Tharon W. (1996). Who "owns" electronic texts? In Patricia Sullivan & Jennie Dautermann (Eds.), *Electronic literacies in the workplace: Technologies of writing* (pp. 177-198). National Council of Teachers of English.	4	-	-	2	-
Jackson, Lisa Ann. (2000). The rhetoric of design: Implications for corporate intranets. *Technical Communication, 47*(2), 212-219.	-	4	-	-	-

Text	CWTC 2004	TTC 2004	CPT 2006	PWR 2003	Original, elsewhere, or unknown
Johnson, Robert R. (1997). Audience involved: Toward a participatory model of writing. *Computers and Composition, 14*(3), 361-376. https://doi.org/10.1016/S8755-4615(97)90006-2	10	–	–	–	2
Johnson, Robert R. (1998). Complicating technology: Interdisciplinary method, the burden of comprehension, and the ethical space of the technical communicator. *Technical Communication Quarterly, 7*(1), 75-98. https://doi.org/10.1080/10572259809364618	–	5	–	–	1
Johnson, Robert R. (1998). *User-centered technology: A rhetorical theory for computers and other mundane artifacts.* State University of New York Press.	–	–	–	3[c]	7
Johnson, Robert R. (1999). Johnson responds. *Technical Communication Quarterly, 8*(2), 224-226. https://doi.org/10.1080/10572259909364662	–	4	–	–	–
Johnson-Eilola, Johndan. (1996). Relocating the value of work: Technical communication in a post-industrial age. *Technical Communication Quarterly, 5*(3), 245-270. https://doi.org/10.1207/s15427625tcq0503_1	10	6	–	–	1
Katz, Steven B. (1992). The ethic of expediency: Classical rhetoric, technology, and the Holocaust. *College English, 54*(3), 255-275. https://doi.org/10.2307/378062	12	–	–	4[b]	13
Katz, Susan M. (1998). Writing review as an opportunity for individuation. In *The dynamics of writing review: Opportunities for growth and change in the workplace* (pp. 73-98). Ablex.	–	–	–	3	1
Kramer, Robert, & Bernhardt, Stephen A. (1996). Teaching text design. *Technical Communication Quarterly, 5*(1), 35-60. https://doi.org/10.1207/s15427625tcq0501_3	–	7	–	–	–
Lay, Mary M. (1991). Feminist theory and the redefinition of technical communication. *Journal of Business and Technical Communication, 5*(4), 348-370. https://doi.org/10.1177/1050651991005004002	7	3[d]	–	–	–
Longo, Bernadette. (2000). *Spurious coin: A history of science, management, and technical writing.* State University of New York Press.	–	–	–	–	4

Text	CWTC 2004	TTC 2004	CPT 2006	PWR 2003	Original, elsewhere, or unknown
MacKinnon, Jamie. (1993). Becoming a rhetor: Developing writing ability in a mature, writing-intensive organization. In Rachel Spilka (Ed.), *Writing in the workplace: New research perspectives* (pp. 41-55). Southern Illinois University Press.	-	-	-	3	1
Miller, Carolyn R. (1979). A humanistic rationale for technical writing. *College English, 40*(6), 610-617.	13	9[d]	-	-	14
Miller, Carolyn R. (1984). Genre as social action. *Quarterly Journal of Speech, 70*(2), 151-167. https://doi.org/10.1080/00335638409383686	-	-	-	-	8
Miller, Carolyn R. (1989). What's practical about technical writing? In Bertie E. Fearing & W. Keats Sparrow (Eds.), *Technical writing: Theory and practice* (pp. 14-24). Modern Language Association.	-	6	-	3	5
Mirel, Barbara. (1996). Writing and database technology: Extending the definition of writing in the workplace. In Patricia Sullivan & Jennie Dautermann (Eds.), *Electronic literacies in the workplace: Technologies of writing* (pp. 91-114). National Council of Teachers of English.	4	-	-	-	-
Mirel, Barbara. (2002). Advancing a vision of usability. In Barbara Mirel & Rachel Spilka (Eds.), *Reshaping technical communication* (pp. 165-188). Lawrence Earlbaum.	-	8	-	-	-
Moore, Patrick. (1999). Myths about instrumental discourse: A response to Robert R. Johnson. *Technical Communication Quarterly, 8*(2), 210-223. https://doi.org/10.1080/10572259909364661	-	5	-	-	1
Moses, Myra G., & Katz, Steven B. (2006). The phantom machine: The invisible ideology of email (a cultural critique). In J. Blake Scott, Bernadette Longo, & Katherine V. Wills (Eds.), *Critical power tools: Technical communication and cultural studies* (pp. 71-105). State University of New York Press.	-	-	4	-	-
Ornatowski, Cezar M. (1992). Between efficiency and politics: Rhetoric and ethics in technical writing. *Technical Communication Quarterly, 1*(1), 91-103. https://doi.org/10.1080/10572259209359493	-	-	-	5	3

Text	CWTC 2004	TTC 2004	CPT 2006	PWR 2003	Original, elsewhere, or unknown
Paradis, James. (1991). Text and action: The operator's manual in context and in court. In Charles Bazerman & James Paradis (Eds.), *Textual dynamics of the professions: Historical and contemporary studies in writing in professional communities* (pp. 256-278). University of Wisconsin Press.	7	–	–	–	3
Porter, James. E. (1998). The exercise of critical rhetorical ethics. In *Rhetorical ethics and internetworked writing* (pp. 133-147). Ablex.	–	3	–	–	1
Redish, Janice C. (2000). What is information design? *Technical Communication, 47*(2), 163-166.	–	7	–	–	–
Rude, Carolyn D. (1995). The report for decision making: Genre and inquiry. *Journal of Business and Technical Communication, 9*(2), 170-205. https://doi.org/10.1177/1050651995009002002	5	–	–	–	3
Rude, Carolyn D. (2009). Mapping the research questions in technical communication. *Journal of Business and Technical Communication, 23*(2), 174-215. https://doi.org/10.1177/1050651908329562	–	–	–	–	11
Russell, David R. (1993). The ethics of teaching ethics in professional communication: The case of engineering publicity at MIT in the 1920s. *Journal of Business and Technical Communication, 7*(1), 84-111. https://doi.org/10.1177/1050651993007001005	–	4	–	–	–
Rutter, Russell. (1991). History, rhetoric, and humanism: Toward a more comprehensive definition of technical communication. *Journal of Technical Writing and Communication, 21*(2), 133-153. https://doi.org/10.2190/7BBK-BJYK-AQGB-28GP	11	–	–	–	4
Salvo, Michael J., & Rosinski, Paula. (2009). Information design: From authoring text to architecting virtual space. In Rachel Spilka (Ed.), *Digital literacy for technical communication: 21st century theory and practice* (pp. 103-127). Routledge.	–	–	–	–	4
Selber, Stuart A. (1994). Beyond skill building: Challenges facing technical communication teachers in the computer age. *Technical Communication Quarterly, 3*(4), 365-390. https://doi.org/10.1080/10572259409364578	6	–	–	–	1

Text	CWTC 2004	TTC 2004	CPT 2006	PWR 2003	Original, elsewhere, or unknown
Selber, Stuart A., Johnson-Eilola, Johndan, & Selfe, Cynthia L. (1995). Contexts for faculty professional development in the age of electronic writing and communication. *Technical Communication, 42*(4), 581-584.	-	4	-	-	-
Selfe, Cynthia L., & Hawisher, Gail E. (2002). A historical look at electronic literacy: Implications for the education of technical communicators. *Journal of Business and Technical Communication, 16*(3), 231-276. https://doi.org/10.1177/1050651902016003001	-	4	-	-	-
Selfe, Cynthia L., & Selfe, Richard J., Jr. (1994). The politics of the interface: Power and its exercise in electronic contact zones. *College Composition and Communication, 45*(4), 480-504. https://doi.org/10.2307/358761	6	-	-	-	3
Selzer, Jack. (1983). The composing process of an engineer. *College Composition and Communication, 34*(2), 178-187.	10	-	-	-	3[a]
Slack, Jennifer Daryl, Miller, David James, & Doak, Jeffrey. (1993). The technical communicator as author: Meaning, power, authority. *Journal of Business and Technical Communication, 7*(1), 12-36. https://doi.org/10.1177/1050651993007001002	11	7	3	5[b]	4
Spilka, Rachel. (1990). Orality and literacy in the workplace: Process- and text-based strategies for multiple audience adaptation. *Journal of Business and Technical Communication, 4*(1), 44-67. https://doi.org/10.1177/105065199000400103	-	-	-	3	1
Spilka, Rachel. (1995). Communicating across organizational boundaries: A challenge for workplace professionals. *Technical Communication, 42*(3), 436-450.	-	4	-	-	-
Spinuzzi, Clay. (1996). Pseudotransactionality, activity theory, and professional writing instruction. *Technical Communication Quarterly, 5*(3), 295-308. https://doi.org/10.1207/s15427625tcq0503_3	-	4	-	-	1
Sullivan, Dale L. (1990). Political–ethical implications of defining technical communication as a practice. *Journal of Advanced Composition, 10*(2), 375-386.	10	-	-	-	-

Text	CWTC 2004	TTC 2004	CPT 2006	PWR 2003	Original, elsewhere, or unknown
Sullivan, Patricia, & Porter, James E. (1993). On theory, practice, and method: Toward a heuristic research methodology for professional writing. In Rachel Spilka (Ed.), *Writing in the workplace: New research perspectives* (pp. 220-237). Southern Illinois University Press.	10	–	–	–	2[a]
Thatcher, Barry. (2009). Understanding digital literacy across cultures. In Rachel Spilka (Ed.), *Digital literacy for technical communication: 21st century theory and practice* (pp. 169-198). Routledge.	–	–	–	–	4
Thralls, Charlotte, & Blyler, Nancy Roundy. (1993). The social perspective and pedagogy in technical communication. *Technical Communication Quarterly, 2*(3), 249-269. https://doi.org/10.1080/10572259309364540	–	7	–	–	–
Thralls, Charlotte, & Blyler, Nancy Roundy. (1993). The social perspective and professional communication: Diversity and directions in research. In Nancy Roundy Blyler & Charlotte Thralls (Eds.), *Professional communication: The social perspective* (pp. 3-34). Sage.	9	–	–	–	–
Thrush, Emily A. (1997). Multicultural issues in technical communication. In Katherine Staples & Cezar Ornatowski (Eds.), *Foundations for teaching technical communication: Theory, practice, and program design* (pp. 161-178). Ablex.	–	6	–	–	–
Wilson, Greg, & Herndl, Carl G. (2007). Boundary objects as rhetorical exigence: Knowledge mapping and interdisciplinary cooperation at the Los Alamos National Laboratory. *Journal of Business and Technical Communication, 21*(2), 129-154. https://doi.org/10.1177/1050651906297164	–	–	–	–	4
Winsor, Dorothy A. (1990). Engineer writing/writing engineering. *College Composition and Communication, 41*(1), 58-70.	7	–	–	–	3
Wolfe, Joanna. (2009). How technical communication textbooks fail engineering students. *Technical Communication Quarterly, 18*(4), 351-375. https://doi.org/10.1080/10572250903149662	–	–	–	–	6

Text	CWTC 2004	TTC 2004	CPT 2006	PWR 2003	Original, elsewhere, or unknown
Zoetewey, Meredith W., & Staggers, Julie. (2004). Teaching the Air Midwest case: A stakeholder approach to deliberative technical rhetoric. *IEEE Transactions on Professional Communication, 47*(4), 233-243. https://doi.org/10.1109/TPC.2004.837969	-	-	-	-	5

[a] *One syllabus provided both the original of these texts and its reprint in* CWTC.

[b] *One syllabus listed these texts in both* CWTC *and* PWR.

[c] *One chapter of Johnson's book is reprinted in* PWR.

[d] *One syllabus listed these texts in both* CWTC *and* TTC.

Of course, while Smith (2000a, 2004) studied citations in journals, the points of reference in Table 3.6 are drawn from graduate-level syllabi. We make no claims about shifts in citation practices in scholarly articles (though we speculate that some of these shifts would be paralleled in scholarly citations). One likely explanation of differences in our list is that while scholars are likely to cite monographs frequently, teachers are less likely to assign monographs in a course that is meant to introduce students to an entire field: teachers can cover a much broader ground with articles and edited collections than with monographs. While many syllabi included a monograph, monograph choices were diverse. Michael Hughes and George Hayhoe's *A Research Primer* was required by six syllabi; Bernadette Longo's *Spurious Coin* was required four times; Robert Johnson's *User-Centered Technology* was required five times (and other syllabi assigned chapters from it); and Clay Spinuzzi's *Network* was assigned twice. Other monographs were assigned only once in the dataset.

■ Conclusions

What, we ask, has changed over the last decade or two that might help to explain changes from Smith's lists to ours? We have three speculations about the reasons for these shifts. First, some scholarly conversations that have become touchstones in the field occurred toward the end of Smith's study, such as the exchange between Robert Johnson and Patrick Moore in the 1998 and 1999 volumes of *Technical Communication Quarterly*. Thirty of the 82 texts in Table 3.6 were published after 1997. Another 15 were published from 1995-1997, which means they were unlikely to be cited much by the end of Smith's (2000a) original study (texts printed from 1988-1997). Of course, the field has changed over the last two decades, and new publications replace older publications as touchstones for scholars and teachers.

Second, we point out that as the discipline has matured, it has relied far less on composition scholarship as touchstones for concepts and approaches to the

field. As early as 2000, Smith (2000a) was observing a shift away from composition theory in citations in the field. Many of the publications that we would identify as composition scholarship on Smith's list of points of reference (e.g., Lisa Ede and Andrea Lunsford's "Audience Addressed/Audience Invoked") do not continue on our list of points of reference (though some are still in our dataset, including Ede and Lunsford's article). Of the texts in Table 3.6, only seven were published in *CCC*. Importantly, six of these are reprinted in *CWTC* and one (Henry, 2001) was reprinted with revisions in *CPT*, and most of them were assigned from these collections. Technical communication appears to have (at least in part) moved away from composition studies as a touchstone for our research and methods. One might even wonder if these texts would be so heavily assigned if they weren't reprinted in *CWTC*, and if other texts about workplace studies, research methods, and digital media might take their place in syllabi.

Which leads to our third speculation, which we have discussed above: the publication of anthologies like *CWTC* and *TTC* made accessing and assigning texts easier, and the editors of these collections seem to have had a strong hand in shaping what the field considers points of reference. It seems that *CWTC* and *TTC* have been particularly influential in shaping the field as it is presented to graduate students. These two collections might be one reason the majority of the points of reference in Table 3.6 are from the 1990s and early 2000s. The continued use of these edited collections has contributed to a list of points of reference that seem to cohere around a body of work published between 1989 and 2002.

Certainly, *CWTC* and *TTC* have done and continue to do much useful disciplinary work, as is evidenced by their prevalent use in the syllabi in our dataset. As Johnson-Eilola and Selber (2004) perhaps intended, *CWTC*, along with *TTC*, helped to provide scholars and teachers "with a coherent body of disciplinary knowledge" (p. xxvii). Now, nearly two decades after the publication of these two collections, we might ask about the sort of work they do now. Do they, we ask, provide the sorts of points of reference that help the field move forward in research and scholarship when they are used in graduate education? Or do they introduce new scholars to conversations that, now two or three decades old, might prevent (or make more difficult) asking new research and teaching questions that more recent scholarship might provoke? We don't believe we have the answers to these questions, but we believe that the answer might be a little bit of yes and a little bit of no to each one. We certainly can't deny that it's useful for graduate students to read now canonical texts anthologized in these two collections. But we also wonder if an effect of these two collections isn't to flatten the historicity of the anthologized articles. We are certain that teachers likely provide context to students as they read (situating the article in historical context, discussing how the field has responded to questions and problems raised by older works). And most teachers placed these works in conversation with more recent scholarship. For example, one syllabus paired Miller's "A Humanistic Rationale" with Byron Hawk's *Technical Communication Quarterly* article "Toward a Post-Technê"; an-

other paired Emily Thrush's "Multicultural Issues in Technical Communication" with more recent work on race, like Angela Haas' 2012 article "Race, Rhetoric, and Technology." But, we wonder, does the material space of a printed anthology do at least some flattening of the dynamics of scholarly conversations over time? Perhaps it is this flattening that ultimately gets recognized as disciplinarity.

Our examination of this dataset of 60 syllabi updates and expands understanding of the coherence of technical communication as a field. We used the dataset to characterize where and how the foundations of technical communication are taught in graduate curricula. We employed citation and social network analysis to demonstrate the presence of a core set of texts and updated Smith's (2000a, 2004) points of reference for the field by providing a list of the 82 most authoritative texts in our co-citation network. Overall, our characterization implies that our field has "come to grips with a coherent body of disciplinary knowledge" as Johnson-Eilola and Selber (2004, p. xxvii) indicated was necessary for the field to achieve maturity and coherence. We argue that technical communication has achieved adequate maturity to move past our disciplinary anxiety of inadequacy and underdevelopment and to begin to ask new questions.

With this disciplinary maturity comes opportunities for growth and diversity. In closing, we'd like to call attention to a so-far unremarked-upon aspect of our dataset: texts in our updated list of points of reference are authored predominantly by White scholars. In fact, readers might notice that the citation network of this chapter (that is, who we as authors have entered conversation with) is also predominantly White. Rebecca Walton et al. (2019) have observed "the lack of scholarly work by minority scholars" in technical communication, asking the field to consider "how and whose knowledge we legitimize in the field" (pp. 2-3). Their discussion in *Technical Communication After the Social Justice Turn* prompts us to echo their call "to diversifying our field in its foundational theories, its professoriate, its programs, and its citation practices" (p. 3). One avenue forward (among many) is more diverse representation of theories and sites of study in our graduate courses. Certainly, courses like the ones in our study—courses designed to introduce graduate students to the field—must cover some of the foundational work that the field has come to recognize as transmits or points of reference. But there is room for including materials in those courses that enter into conversation with our field's foundational history. And further, we might follow Brooke's (2011) suggestion of teaching how "to read the citation network of the discipline" explicitly in graduate courses (p. 98). For example, a course might pair reading and discussing Godwin Agboka's (2012) "Liberating Intercultural Technical Communication from 'Large Culture' Ideologies" alongside earlier, more foundational work on cross-cultural technical communication in order to not only understand Agboka's critique of "large culture" ideologies but also to explore how Agboka enters into (and constructs through his writing) the conversation about "culture" in the field. Consequently, also following Brooke's (2011) suggestion for rhetoric and composition courses, we might suggest that our graduate courses

do not have to be driven by a coverage model, and that many could instead have students "study a topic or issue as it unfolds in the discipline" and attend to the "epistemic practices" of texts as they join in conversation with each other (p. 102). These are just a few suggestions for graduate education in the field—increasing the diversity of the texts we assign and explicitly teaching technical communication (at least as a scholarly discipline) as a network.

In this chapter, we have used co-citation network analysis to map the field of technical communication. As we have shown, this method of mapping can be useful to identify points of reference central to a field, but as we admit, such a quantitative approach can be limited because it risks reducing the complexity of relationships within a network. As we hope we have shown, these quantitative methods help to abstract the field and allow us to ask questions about the nature of the field. In closing, we suggest that these methods can be combined with other qualitative and quantitative social network analyses, like those advocated by Jordan Frith (2014) in technical communication and Nathan Johnson (2015) in rhetoric and composition, to develop thicker and richer maps of these disciplines. For instance, we might ask how the location of a scholar's graduate training and who they trained under affects their views of the field and how they transmit those views onto their graduate students. Social network analysis can also be used to trace how new ideas or projects develop and spread within a field. Mapping technical communication and rhetoric and composition through social network analysis can help us to see the field differently and thus confirm or question our assumptions about the field.

▮ Acknowledgments

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◼ Appendix: Additional Texts from Our Dataset

Below are the full APA citations for the texts from our dataset that we mention in the chapter but are not listed in in Table 3.6. We do not include the 19 chapters and introduction from Johnson-Eilola and Selber's (2013) *SPTC* (listed in Table 3.4) in this list.

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