8 Infrastructure for the Transfer of Writing Knowledge: Writing Across the Curriculum and Writing in the Disciplines

Writing across the curriculum (WAC) and Writing in the disciplines (WID) approaches to writing education are inescapably shaped by the transfer of writing knowledge. These movements came into being partly in response to concerns that first-year writing courses did not support transfer and continue to exist to support such transfer beyond the first-year writing course—whether through general practices of writing to learn (WAC) or particular practices of writing in discipline-specific genres (WID). Differently put, concerns about the transfer of writing knowledge are central to WAC and WID approaches to writing education. Questions that have motivated the initiation and continued growth of WAC and WID programs—What should first-year writing prepare students for? How do students develop writing knowledge over the course of a college education? How do students learn to write for their disciplines or professions?—are at least in part about transfer, either implicitly or explicitly. In fact, as this chapter will show, much of the research on WAC and WID is premised on the transfer of writing knowledge, which is to say that the transfer—how it does or doesn't happen, across courses, contexts, and curriculum—is a perennial exigency for research on writing education across the curriculum, in the disciplines, and over time.

WAC/WID research that takes up transfer generally follows two main areas of concern: first, that first-year writing as general writing

skills instruction (GWSI) is an abstraction with no context or content and cannot offer transferable practices to disciplinary, professional, or extra-curricular contexts (Crowley, 1998; Downs & Wardle, 2007; Petraglia, 1995; Russell, 1995; Wardle, 2009); and second, that college students experience a range of missed connections that inhibits their writing development: among early writing courses and those encountered later in the disciplines,[8] among disciplinary writing courses or genres,[9] among different courses in the same discipline,[10] or among academic, personal, and professional contexts.[11] Scholars who state their exigency for studying transfer in these terms are often responding to pressure from colleagues or stakeholders to justify the existence of writing courses, programs, or the field of writing studies. Because of the ubiquity and assumed expense of such a widely required course as first year writing, writing studies researchers—and the stakeholders they are often gathering data to speak to—often study transfer in WAC and WID programs to better understand what writing skills, practices, or competencies best support later student learning and thus should be taught in a first-year course.

The quiet presence of transfer in much research on student writing development across college curricula indicates that the concept is found in the background rather than the foreground of WAC / WID researchers' purview. Especially in large-scale or longitudinal studies of writing that capture student transfer activity simply by virtue of their scope, transfer appears in study conclusions or implications rather than in design or research questions (Beaufort, 2007; Carroll, 2002; Chiseri-Strater, 1991; Fishman et al., 2005; Herrington & Curtis, 2000; McCarthy, 1987; Soliday, 2011; Sommers & Saltz, 2004; Stern-

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8. For studies of transfer among early writing courses and those encountered later in the disciplines see Beaufort, 2007; Boone et al., 2012; Carroll, 2002; Herrington & Curtis, 2000; Smit, 2004; Yancey et al., 2014.

9. For studies of transfer among disciplinary writing courses or genres see McCarthy, 1987; Nowacek, 2011; Soliday, 2011; Walvoord & McCarthy, 1990; Zamel & Spack, 2004.

10. For studies of transfer among different courses in the same discipline see Beaufort, 2007; Haas, 1994; Herrington, 1985.

11. For studies of transfer among academic, personal, and professional contexts see Chiseri-Strater, 1991; Collier, 2014; Fishman et al., 2005; Herrington & Curtis, 2000; Reiff & Bawarshi, 2011; Roozen, 2009, 2010; Rounsaville, 2012; Sternglass, 1997.

glass, 1997; Walvoord & McCarthy, 1990). However, to trace writers moving knowledge across or among contexts is to witness transfer, and thus, acknowledging transfer even when it is implicit can give explicit insight into the stops and starts of writing knowledge development and expertise: the complications, disconnects, uneven acquisition, regressions, or unstated connections that students experience as they attempt to transfer their writing knowledge across curricular or disciplinary settings (Boone et al., 2012; Melzer, 2014). Therefore, this chapter, while focusing on WAC/WID research that discusses transfer explicitly, will also include some work that assumes or alludes to transfer implicitly.

The review below includes scholarship that treats writing as a general learning skill (writing as generalizable activities like freewriting, journaling, note-taking, reflecting etc.); a socialized disciplinary activity (largely to do with genres); a process or procedural activity (steps taken through an assignment or in a writer's composition routines); the activity that compromises the discipline of writing studies itself (writing knowledge as a unique research-based domain); or simply as a vessel through which assessment of content occurs. While some of these treatments of writing, which often reveal what researchers think writing is or can do in a college curriculum, are easily separable into more procedural WAC or declarative WID categories, most of them blur these lines between generalizable and situated activities. This is to say that much of the research below weaves in elements of both WAC and WID approaches as scholars pursue questions not about what WAC and WID approaches really are, but about how writing and learning are happening, in varied forms, in their classrooms and programs. This chapter adopts a "synthesis" approach to WAC/WID to highlight WAC/WID relationships in the reviewed work, which in turn shows the multi-directionality of transfer, as knowledge moves "up" vertically in a discipline and "out" across courses and extra-curricular writing contexts that students encounter over time (Bizzell, 1982/2003; Ford, 2004; Teich, 1987). This capacious frame helps account for the ways that the WAC/WID relationship mirrors what transfer research from cognitive psychology shows us: that "*general* cognitive skills" exist, but they "function in *contextual* ways" (Perkins & Salomon, 1989, p. 19, emphasis added). This chapter follows that cue by presenting sections organized by researchers' common problems or questions about the transfer of writing knowledge in WAC/WID approaches, which co-

here around what students are learning about writing with or through transfer, what instructors are or should be doing to support that transfer, how genre plays a role in that transfer, and the kinds of courses or curricula that best support student transfer and learning in and across disciplines or curricular contexts.

Student Knowledge about Disciplinary Writing Transfer

Much WAC/WID scholarship seeks to understand how students transfer writing knowledge among contexts and over time through their experiences of single courses or programs,[12] across pairs of courses, usually first-year writing and a disciplinary course,[13] or over time on (and off) single campuses.[14] These scholars study students' knowledge of disciplinary writing in order to understand the efficacy of a range of programmatic efforts, including genre instruction, student interpretation of course requirements or sequences, and impact of feedback practices or instructional focus on rhetorical awareness or the writing process. In particular, although these studies offer a range of perspectives into students' disciplinary writing knowledge and the potential for its transfer, the studies largely conclude with a similar take away: that students' transfer of writing knowledge—from general to disciplinary courses, across campus careers, or longitudinally over time—is well supported by intentionally making writing knowledge transparent, explicit, and relevant to students' lives.

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12. For studies of how students transfer writing knowledge through their experiences of single courses or programs see Bergmann & Zepernick, 2007; Carter et al., 2007; Gilje, 2010; Hilgers et al., 1995; Hilgers et al., 1999; Jarratt et al., 2009.

13. For studies of how students transfer writing knowledge across pairs of courses, usually first-year writing and a disciplinary course, see Adler-Kassner et al., 2012; Ahrenhoerster, 2006; Fallon et al., 2009; Johnson & Krase, 2012; Stretcher et al., 2010.

14. For studies of how students transfer writing knowledge over time on single campuses see Beaufort, 2007; Carroll, 2002; Chiseri-Strater, 1991; Fishman et al., 2005; Herrington & Curtis, 2000; McCarthy, 1987; Nowacek, 2011; Sommers & Saltz, 2004; Spack, 1997; Sternglass, 1997; Walvoord & McCarthy, 1990.

Single Course Contexts

In a study that sought to capture what students come to know in a single course, as shaped through the relationship between disciplinary writing knowledge and more generalized forms of writing to learn activities, Carter et al. (2007) conducted student interviews to understand how writing supports learning in a biology lab. Following a situated approach to cognition and learning (Lave, 1988; Russell, 1995; Russell, 1997), they hypothesized that disciplinary writing, in the sciences in this study, promoted a certain kind of socialization into disciplinary learning. Thus, their study hoped to understand how writing in the disciplines encouraged learning in the disciplines. Interviews with ten students writing lab reports in biology revealed six categories of learning activities, including learning by writing in general, by writing in specific genres (the lab report and "reports for future reference"), by affiliated learning behaviors like reading or searching, and by learning in contrasting contexts or modes. Of these, transfer was most implicated in disciplinary learning enacted through writing reports for future reference and through learning in other contexts. That is, two of their findings show that writing to learn in biology is supported specifically through transfer activities: Students reported using lab reports in future learning situations, transferring the disciplinary writing knowledge to different contexts and continuing to learn from them, sometimes describing an "awareness that the lab reports written for this biology course could be used as a basic reference in more advanced courses in the same or a similar field" (Carter et al., 2007, p. 291). Students also reported that writing biology lab reports "has led or would lead to" their report writing "elsewhere," describing that lab report writing "carried over" to disciplinary writing in other science labs (p. 292). In these ways, students understood the lab report as an activity situating them not only in their immediate lab's community of practice, but also acting as a "vehicle" or a "link" that connected them to a broader scientific community encompassing their other science courses and their future work (p. 297). In essence, the lab report was an "apprenticeship genre" (p. 296) that allowed for students to participate in the biology lab community's ways of knowing, showing that writing is a key form of "legitimate peripheral participation" (Lave & Wenger, 1991) as well as the ways students come to understand disciplines through acts of transfer.

With a similar single-course focus, Gilje (2010) differently complicates writing knowledge by looking at the transfer not of textual or procedural writing knowledge but of "meaning-making" knowledge across modes that include writing. Gilje's study of a filmmaking course in a Danish high school is not concerned with the acquisition of writing or disciplinary knowledge but rather with how students can carry meaning-making practices intentionally across modes and over time, showing "how a specific meaning is transformed and transduced within and across modes" (p. 495). He simply happens to focus on one discipline, which is film. To do this, Gilje collected interactional and textual data around the creation of one film scene in a media education class at an urban secondary school in Oslo. Focusing on students' composing practices across modes, including visual, written, and oral, he traced the "mediated action" occurring during composing—students' negotiations, their deployments of semiotic resources, and their collaboration and distributed agency—while also analyzing the transformation and transduction of meaning across modes (p. 499). Triangulating data sources of recorded observation, student notes, and final films, Gilje traced the trajectory of one particular meaning as it evolved through the composition of one key film scene.

Following a meaning-making trajectory (Kell, 2006) allowed Gilje to see that although students used diverse semiotic resources including synopsis and manuscript writing, storyboard creation, filming, and oral postproduction revision, students were unable to transfer their "particular meaning" across modes and over time because they downplayed the role these resources played in each composing context. For example, the students wrote their film synopsis according to teacher expectations but could not transfer this writing "[tool] for thinking" about plot points when revising the film's eventual narrative. In other words, students' use of semiotic resources, including writing, depended on how intentionally resources were deployed across specific contexts (Gilje, 2010, p. 516). Echoing a common theme across transfer research in and beyond writing studies (see Chapter 2), Gilje's study stresses the level of explicit instruction on transfer that students need to understand how meaning-making carries and shifts across modes, genres, and contexts.

Transfer from General Writing to Disciplinary Courses

Scholars also seek to understand how students transfer writing knowledge from general to disciplinary writing courses, even embedding assumptions about this transferability in "from. . . to" construction in titles (Johnson & Krase, 2012). Such analytic linking occurs in Adler-Kassner et al.'s (2012) examination of the transfer of threshold concepts across linked writing and history general education courses, in which text-based interviews showed that students concurrently enrolled in both courses experienced shifts—from tacit to more consciously discursive—in their rhetorical understanding of audience, purpose, and context. Ahrenhoerster (2006) also used course comparison—first-year writing to communication or history—to study how well first-year writing "proficiencies" (including mastery of punctuation and grammar rules, using diction properly and constructing effective sentences; effective organization; effective argument and idea development; appropriate depth of critical reading and thinking [p. 22]) transferred into subsequent disciplinary essays, finding in analysis of 115 essays and a large-scale student survey that the disciplinary essays were of similar quality to those in the first-year course, with highest proficiency in organization. Because students could have entered the first-year course with these existing proficiencies, Ahrenhoerster's study highlights the correlation of these skills more than a clear transfer of learning from the first-year writing course to a disciplinary course.

In a study that similarly traces transfer from general to disciplinary courses, Fallon et al. (2009) gathered data—students' self-reports of their writing skills and faculty-scored psychology essays—to understand how writing skills transferred from first-year writing to an assignment in a subsequent psychology course. In comparing the survey and scored papers, the researchers found that while students who reported using a drafting process (74%) had higher paper scores, as well as higher final grades in both courses, than those who did not draft, they found it hard to isolate this relationship as evidence of transfer of writing knowledge from English to psychology writing (p. 44). Therefore, in a follow-up intervention, Fallon et al. incorporated elements to support high-road transfer, helping students "bridge" their courses through explicitly modeled drafting in-class and in faculty feedback. The researchers found that this intervention produced a "distinct relationship" between student confidence and performance (p. 47).

Johnson and Krase (2012) similarly designed a study to follow twelve students from first-year writing to a later range of disciplinary writing courses. They collected data from several sources: students' instructor-scored FYW essays, a NSSE questionnaire in which students self-reported their experiences in FYW and WID coursework, three extended qualitative interviews, and portfolios of students' written work. They analyzed this data for the objectives shared by the university's first-year and disciplinary writing courses, finding that ten of the twelve research participants demonstrated "significant progress" toward practicing successful writing, understanding main features of writing, adapting writing to reader expectations, and learning conventions of usage in their fields (p. 7). Researchers attributed this success to a set of motivational characteristics (like willingness to seek out feedback or revise) as well as to appropriate instructional design with clear expectations and guidelines for writing.

Tracing transfer from technical communication to engineering courses, Ford (2004) found evidence of the transfer of rhetorical knowledge—defined as audience awareness, sense of purpose, organization, use of visuals, professional appearance, and style. Analyzing the self-reported conceptual, behavioral, and rhetorical strategies and skills of twelve seniors through group think-aloud protocols, scored student texts, and student and instructor interviews, she found that rhetorical strategies taught in technical communication courses did appear in students' later disciplinary texts, especially in students' process-based and rhetorical approaches to writing like considering audience and purpose. Students reported that they learned these rhetorical strategies in their technical communication courses and did rely on them when completing writing assignments. In particular, they relied on modeled or template-based rhetorical strategies more often than abstract concepts like audience.

Researchers have also enacted this from/to analysis at the graduate level, as in Stretcher et al.'s (2010) research on graduate students' transfer of communication skills from an MBA communication course to a subsequent content-based MBA finance course. Specifically, the researchers followed business communication strategies such as "organizing their ideas, composing coherent messages, and presenting data in a format that is understandable to non-specialists in the finance field" (p. 2). Stretcher et al. were troubled that the MBA students used such communication practices in their jobs but couldn't see the purpose of

the communication course in relation to the finance course. There-fore, the group sought to isolate which specific communication strate-gies students applied to the finance course with the ultimate curricular goal of students building on their communication competencies over time. The authors traced this transfer through several methods: (a) the MBA students' application of the communication course strategies to collaborative assignments in the finance course like written reports, oral presentations, and case studies; (b) a student survey about how they perceived the difficulty of these writing assignments, with an ad-ditional survey section for students who had taken the communication course that asked about their recollection of the course and application of its strategies; (c) a group oral presentation of a case study scored by a non-specialist professor; and (d) another student survey about how the communication course prepared them for working in teams. Stretcher et al.'s analysis of this data found that students most frequently men-tioned organization and citation strategies from the communication course but found that the course had a minimal impact on students' perceived difficulty of the finance course writing. They did not find significant differences in students' assignment grades whether or not they had taken the communication course.

Transfer Across Multiple Courses on Single Campuses

Several studies also have sought to understand what students come to know across multiple courses in WAC/WID or writing-intensive programs, in effect capturing the culture of writing on their campuses. For example, the extensive writing-intensive course requirements at the University of Hawaii-Manoa led Hilgers et al. (1995) to study their students' experiences of the requirements. Specifically, they looked for evidence that students' writing knowledge was impacted by taking the three or more writing-intensive classes that were required of them. Hilgers and his colleagues interviewed 82 seniors and found through inductive analysis several themes in students' understandings of what they had learned in their writing-intensive courses, including writing-based skills and problem-solving abilities. Their survey data, in which 78% of respondents reported becoming better writers through their writing-intensive curriculum, showed that "the key factor [students] pointed to is not the amount of practice they got or the quantity they wrote; it is the amount of feedback that their course instructors and their peers gave their writing" (p. 79). Compellingly, Hilgers et al. also

found that students had typically taken five, rather than the required three, writing-intensive classes, and none complained about the number of these courses required to graduate, showing that students perceived some purpose for so many writing courses, reporting increased confidence as writers and self-efficacy in the learning process.

Hilgers et al.'s (1999) follow-up study, which shared findings from beginning- and end-of-semester interviews with 34 students, aimed to understand first, how the discipline affected students' understanding of writing tasks and second, what students completing the university's five-course writing requirement reported that they know about writing. Their interview data revealed several patterns relevant to students' transfer of disciplinary writing knowledge: (a) students were more invested in writing courses in, rather than outside of, their majors, and that investment extended to writing assignments for which they chose their own topics relevant to their major or future work; (b) students made connections between disciplinary writing and future professional writing, thinking that disciplinary writing tasks predicted their success in similar professional tasks and that they needed to simultaneously write for their teacher and a hypothetical disciplinary audience; and (c) students made connections between disciplinary knowledge and the ways of researching and writing that suited that knowledge, leading them to learn not only about content but about the nature of research, methodology, and questions that matter in their discipline.

In response to their second research question on what students reported they knew about writing in general, the researchers found that students were most of all aware of the writing process, understanding it as "a set of problems to be solved and goals to be reached" (Hilgers et al., 1999, p. 334) although they also were aware of general benefits of writing and believed it promoted learning, thinking (organizing and refining ideas, thinking more deeply), and confidence. From these findings, the researchers conclude that although students seemed much more invested in writing-intensive courses as disciplinary and future preparation rather than as general writing-to-learn practices, the researchers believe students were practicing writing-to-learn across disciplinary contexts without labeling it as such. They suggest more explicit naming of these strategies by instructors would help students make connections, or transfer their writing knowledge, among "apparently disparate" writing and disciplinary contexts that students already

do "haphazardly" so that students can write to "solve potentially related sets of epistemological or rhetorical problems" (p. 348).

With findings that highlight instead students' *low* investment in campus writing courses, Bergmann and Zepernick's (2007) study unknowingly captured campus writing perceptions that likely affected transfer. They asked students, in student-led focus groups, how they described their own writing processes, which unexpectedly yielded data about the larger peer culture of writing on their campus. Across six focus groups of seven to ten participants from a variety of departments, the researchers noticed a surprising similarity in student beliefs about writing development that students seemed to be carrying across campus (p. 126). These beliefs, which arose through inductive analysis of focus group transcripts, included: (a) that writing in first-year writing courses (which students conflated with literature courses) is personal and expressive (not academic), and therefore instructor feedback feels subjective and intrusive; (b) this expressive writing is natural, like conversation, and has to do with more personal preference than informed academic judgment; (c) disciplinary writing, on the other hand, has standards, rules, norms, and conventions; and (d) students do transfer writing knowledge about process, audience, and purpose across contexts, but do not locate learning that knowledge in writing courses, first-year or disciplinary, but rather in life and work experience. Bergmann and Zepernick call these beliefs about writing and learning to write an unrecognized element of student peer culture on their campus, concluding that such perceptions may limit students' abilities to recognize the writing knowledge they do learn in first-year writing and transfer it to other writing, particularly disciplinary, contexts. Regarding transfer, they echo findings from psychology regarding students' mindful monitoring of transfer (see Chapter 2), suggesting that the primary obstacle, then, to writing knowledge transfer is "not that students are *unable* to recognize situations outside FYC in which skills can be used, but that students *do not look for* such situations because they believe that skills learned in FYC have no value in any other setting" (p. 139).

Transfer in Longitudinal Studies

Finally, scholars have captured students' transfer of writing knowledge in large-scale, longitudinal studies of writing development that either follow the development of a small number of writers during college

or capture the development of a large number of students on a single campus.[15] These large-scale studies all use multiple data sources and methods with a sociocultural theoretical framework, in particular classroom observation, student and teacher interviews, and student text analysis, to understand the writing experiences of one or a handful of college students over time, from a single semester through postgraduate years (Beaufort, 2007; Carroll, 2002; Chiseri-Strater, 1991; Herrington & Curtis, 2000; McCarthy, 1987; Nowacek, 2011; Soliday, 2011; Sternglass, 1997; Walvoord & McCarthy, 1990). Interestingly, as some of the most extensive studies of student writing completed in the US, they are also projects in which the phenomenon of transfer is only implicit. For example, in both McCarthy (1987) and Herrington and Curtis' (2000) reports of their longitudinal research, transfer is somewhat incidental to their research questions—Herrington and Curtis in fact never mention the term explicitly in their book. Instead, Herrington and Curtis present the development of four college writers' identities through extended case studies, showing how academic writing impacts their sense of self during college and beyond. The project's affinities with transfer research appear in the conclusion, when Herrington and Curtis stress that for student writing development to occur, instructors must make explicit the implicit "whys" of academic and disciplinary conventions, not just the "hows" that are more often taught (p. 387). Thus, in addition to an early articulation of the social contours of writing development, Herrington and Curtis argue for what has become one norm of teaching for transfer, that unveiling tacit disciplinary knowledge helps students navigate the "dizzying array" of writing expectations and norms they encounter as they develop their connected personal and academic writing over time (p. 387).

Similarly, McCarthy's (1987) study of one college student, Dave, struggling to apply what he learned in first-year writing to subsequent courses in poetry and cell biology did not set out to understand the transfer of his writing knowledge. In fact, the research article reporting on the study only mentions transfer once, concluding that "skills mastered in one situation, such as the thesis-subpoint organization in Freshman Composition, did not . . . automatically transfer to new contexts with differing problems and language and differing amounts of knowledge that he controlled" (p. 261). Through rigorous analysis

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15. See Rogers (2010) for a thorough summary of longitudinal studies of writing development.

of Dave's writing behaviors and feedback engagement with his three instructors, including identifying, classifying, and counting his "conscious concerns" as he wrote during a think-aloud protocol, McCarthy concludes that writing success occurs most for students who deduce without being explicitly taught "the content, structure, language, ways of thinking, and types of evidence required in that discipline and by that teacher" (p. 233). That is, she turns to transfer because transfer was *not* occurring for Dave, finding that in each class he encountered, he believed that the disciplinary writing was "totally unlike anything he had ever done before" (p. 234), leading him to write like an academic newcomer or "beginning language user" in each context (p. 261). Like Herrington and Curtis, McCarthy points readers to the "social contexts those classrooms provide for writing," including the social functions writing served there and the social roles available to the student writers when they composed, as one explanation for these missed opportunities for student writing development (p. 261).

With a similar analytic focus on socialization in new writing contexts, the Harvard Study of Undergraduate Writing (Sommers, 2008; Sommers & Saltz, 2004) provides a large-scale institutional example that, due to research design, includes elements of WAC/WID approaches to education in their broad data collection. Although not explicitly invoking transfer, Sommers and Saltz (2004) try to understand why some college students improve and engage with writing over time while others lose interest. The Harvard Study of Undergraduate Writing followed 422 students from the Harvard Class of 2001 through their college careers "to see undergraduate writing through their eyes" (Sommers & Saltz, 2004, p. 126). Researchers randomly sampled 65 of these participants to interview each semester alongside a semester's worth of graded and commented-on writing assignments. In analyzing not just student writing, but also how student language about writing changes over time, Sommers and Saltz isolated two central student perceptions: (a) students who perceive themselves to be novices seem most able to learn new writing skills and (b) students who perceive writing to be a long-term opportunity to "write about something that matters to them" seem most able to remain interested and engaged in their college writing (p. 127). In particular, their analysis shows how engaged first-year novices experience change within themselves as writers rather than in their texts—they adopt an approach of reciprocity, understanding "what they can 'get' and 'give' through writ-

ing" (p. 146), which sustains their interest and allows for change over time. Students in the study who were not able to take on a novice role—and were not modeled or granted that role through instructor feedback—and instead relied on already-mastered high school writing methods did not experience change, in themselves or in their texts (p. 140). Sommers and Saltz ultimately conclude that students build on their writing knowledge over time by approaching their first year as novices who are subsequently invited into disciplinary writing and thinking expertise, which helps them move on from their novice position to "question sources, develop ideas, and comfortably offer interpretations" (p. 146).

On the other hand, empirical studies like Beaufort (2007) and Nowacek (2011) do explicitly focus on the transfer of writing knowledge in their research designs and questions. Beaufort's longitudinal case study of Tim, a college student writing in first-year composition, history, and engineering courses, and eventually at work, tracks his struggles transferring writing knowledge across these contexts. The book argues that Tim's struggles are the result of never being explicitly taught the knowledge that supports writing success. Beaufort's contribution is a clear articulation of what that knowledge is, using rich ethnographic detail to concretize the framework of overlapping knowledge domains (previously developed in her ethnography *Writing in the Real World*) she says are necessary for success with writing projects: discourse community knowledge, genre knowledge, rhetorical knowledge, subject matter knowledge, and writing process knowledge. Her conclusion and appendices show how curricula can be designed to explicitly teach writing concepts that live in these domains, aiming to foster a meta-awareness of how they enact those concepts in their writing so they become transferable writing skills in future writing contexts. Like McCarthy (1987) and Herrington and Curtis (2000) above, Beaufort's three principles for facilitating the transfer of writing knowledge anticipated what now are common pedagogical suggestions in transfer research (taken up later in this chapter): (a) generalizing specific writing tasks into abstract writing concepts (e.g. genre) to make instructors' tacit conceptual knowledge explicit to students; (b) providing students opportunities to practice applying those concepts in a variety of writing assignments and situations; and (c) facilitating students' meta-awareness of that practice and potential for application in new writing contexts.

Nowacek's (2011) study of a three-semester interdisciplinary learning community also aims to explicitly study the transfer of writing knowledge but in doing so complicates much of the previous empirical work on transfer. By studying writing in a general education interdisciplinary learning seminar, which linked three courses in history, literature, and religious studies, Nowacek was able to capture both general and discipline-specific writing instruction received and taught by 18 students and three team-teaching instructors in the second semester of the seminar. Building on a theoretical framework informed by rhetorical genre studies, sociocultural approaches to transfer, and activity theory, Nowacek traced how students experienced genres as social and rhetorical resources, but more so as catalysts for making conceptual connections across disciplinary expectations occurring in the same classroom (p. 12). Most centrally, she offers a theory of transfer as dynamic "recontextualization"—not mere application but adaptation and transformation—of writing knowledge, with students as "agents of integration" who enact rhetorical strategies that help them "see" interdisciplinary connections (perceive them) and then "sell" those connections (convey them to others) in their writing, to "justify the value of the connection within the text itself" (p. 53). Nowacek concludes that instructors (and writing center tutors), too, are agents in students' successful transfer of writing knowledge, acting as "handlers" who can cue or fail to cue potential acts of transfer. Expanding on Beaufort's (2007) recommendations regarding meta-awareness, Nowacek reminds readers that transfer is never easily studied or taught: teaching students meta-awareness of their writing knowledge can support but not always guarantee transfer (and sometimes transfer happens without writers' conscious awareness), and even in an intentionally connected interdisciplinary writing community, instructors and students struggle to reconcile contrary or contradictory writing values and conventions.

Interestingly, no matter the design of the studies reviewed above—single course, across general to disciplinary courses, across a single campus, or longitudinally over time—studies about student knowledge of disciplinary writing almost all conclude that explicit instruction of disciplinary writing values, beliefs, genres, expectations, and practices is essential to transfer. For example, studies that trace transfer of writing knowledge from general to disciplinary courses show that students' disciplinary rhetorical knowledge can shift from tacit to more

conscious (Adler-Kassner et al., 2012) when that knowledge is made explicit through modeling and clear disciplinary writing expectations (Fallon et al., 2009; Ford, 2004; Johnson & Krase, 2012). Studies of campus writing cultures or programs (Bergmann & Zepernick, 2007; Hilgers et al., 1999) or writers over time (Beaufort, 2007; Herrington & Curtis, 2000; McCarthy, 1987) show that students carry varied implicit writing values and strategies, suggesting that explicitly teaching the "whys" of gained writing knowledge can help students become more aware of writing knowledge, even if that awareness does not guarantee intentionality or transfer success (Nowacek, 2011). While factors such as student dispositions, investment in learning, socialization, and feedback are factors in transfer of writing knowledge, the strong focus across scholarship on explicit instruction is a key takeaway.

Teacher Knowledge about Disciplinary Writing Transfer

A handful of studies show how instructors understand, experience, or support the transfer of their students' writing knowledge (Baird & Dilger, 2017; Carter, 2007; Fraizer, 2010, 2018; Nelms & Dively, 2007; Wolfe et al., 2014). Scholars often focus on teachers or practitioners to understand how to improve faculty or graduate student development, better communicate with faculty colleagues, or simply include another stakeholder perspective on the classroom context. In particular, these studies look for commonalities among disciplinary writing knowledge rather than for differences; they set out to smooth the path for student transfer of writing knowledge rather than point to obstacles that occur after FYW. One way into this comparative work has been to study faculty conversation around disciplinary writing values.

Nelms and Dively's (2007) study seeks instructor perspectives on the transfer of writing knowledge from FYW courses to post-FYW writing contexts. Nelms and Dively surveyed graduate student instructors teaching FYW about the content and skills they teach, and then conducted focus groups with instructors teaching writing-intensive courses in applied sciences about the writing skills they saw in their courses. The TAs reported emphasizing writing process, peer response, the formulation of main ideas, audience analysis, developing ideas, text analysis, argument structure, claim support, organization, source use and citation and most frequently assigning analytic

essays, persuasive essays, response journals, and research papers. For their part, the instructors in writing-intensive courses observed that their students did use writing approaches they assumed they learned in FYW—supporting a thesis, text analysis, citation—but also reported that students were unmotivated to write in general. The instructors themselves expressed lacking time to teach writing at all. These findings lead Nelms and Dively to agree with Melzer (2014) and Fraizer (2018) that instructors across programs and departments need a shared vocabulary about writing to dismantle such roadblocks to transfer, suggesting venues like WAC/WID workshops to support increased communication and interdisciplinary exchange around writing concepts, skills, genres, and student attitudes.

Similarly, Wolfe et al.'s (2014) article seeks to move beyond the premise that first-year writing does not promote transfer of writing knowledge to the disciplines. Like Carter (2007) and Thaiss and Zawacki (2006), the authors argue that disciplines similarly value writing knowledge that is argumentative, addresses an insider audience, shows evidence for claims, makes claims about generating new knowledge, and cites existing knowledge. But Wolfe et al. aim to be more specific about these commonalities, using systematic analytic methods to understand the fine-grained expressions of these in disciplinary texts. Using Comparative Genre Analysis (CGA) developed in EAP/ESP, the researchers compared the literary analysis often taught in their local first-year writing courses to conventions found in genres from business, psychology, nursing, biology, engineering, and history textbooks and WID scholarship that describes what practitioners from these disciplines value in student writing, as well as in undergraduate essays from undergraduate journals, conference collections, and instructor websites. Specifically, they used three areas of rhetorical analysis—topoi or lines of argument, macrostructures, and citation conventions—to unearth not only disciplinary writing knowledge but also the values and conventions that index the larger activity systems of which they are a part (p. 45).

Following these three areas, they found several similarities and differences in valued writing knowledge among literary analysis and genres from the disciplines above. They found topoi commonalities like identification and interpretation of a pattern and using a theoretical concept to interpret primary material or analyze phenomena under study. But they observed "dramatic differences" in macrostructures,

with thesis-first or thesis-last organizations indexing disciplinary norms for inductive or deductive reasoning, as well as citation differences even among genres within disciplines indexing values around individuality, collaboration, and critique. These nuances lead Wolfe et al. to several pedagogical recommendations to support students' navigation of the transfer of writing knowledge from FYW to these disciplines. They suggest that FYW could do more to support rhetorical similarities such as these even if they are not universal but shared by just a few disciplines, helping students recognize and navigate these similarities and differences, proposing that FYW instructors first develop meta-awareness of differences and commonalities among disciplinary rhetorical knowledge and then pass that meta-awareness on to their students. With suggestions similar to pedagogies like teaching for transfer (Yancey et al., 2014) and genre pedagogies (Bawarshi & Reiff, 2010), they argue that this meta-awareness can be best supported by being explicit about underlying rationale and values rather than arbitrary expectations or random formalities. They suggest activities and assignments that call students' attention to common topoi, macrostructures, and citation norms through analyzing genre features and learning what questions to ask in new rhetorical contexts, always tying these analyses to disciplinary values around writing knowledge.

Carter (2007) describes a project in which departmental faculty worked together to identify their discipline's "ways of doing" that revealed the "ways of knowing and writing" that they valued in turn. Although Carter's ultimate goal is to forward a structure in which "metagenres" and "metadisciplines" help WID professionals guide faculty development in teaching with writing, his description of departmental conversations around writing values reveals implicit assumptions about how writing knowledge accumulates via transfer as students move through a major. In Carter's theory, metadisciplines is a category that emphasizes the procedural knowledge or ways of knowing, doing, and writing, that are common to disciplines. Metagenres are the patterned doing within these, genres of genres or general "ways of doing" that pattern into "similar *kinds* of typified responses to related recurrent situations" (pp. 393). He names four: (a) responses to academic situations that call for problem solving (plans, reports, proposals); (b) responses to academic situations that call for empirical inquiry; (c) responses to academic situations that call for research from sources; and (d) responses to academic situations that call for

performance. Importantly, Carter says all of these highlight the relationships among disciplines, thus smoothing the path for transfer to occur. Carter uses his theory essentially to emphasize the intersections and ties both among disciplines and between disciplinary and writing knowledge. He argues that specialized disciplinary knowledge "is not so special" just as generalized writing knowledge "is not so general." Instead, the assumed disjuncture between general writing knowledge and specialized disciplinary knowledge is "porous" and "in flux," with writing located neither fully in nor out of a discipline's more connected boundaries (p. 410).

Fraizer's (2018) study similarly seeks to scaffold faculty professional development around writing. Proposing a model of WAC faculty development which promotes faculty awareness of their students' transfer attempts, Fraizer shows that a "dynamic and contextualized" faculty conversation around writing assignments can help them support both their and their students' transfer of writing knowledge. In designing his study—three stages of student reflections and six faculty members discussion of those reflections—Fraizer sought a strategy to support student transfer as they worked on writing assignments—not after the fact but mid-process. Following Beaufort (2007), Nelms and Dively (2007), and Yancey et al.'s (2014) recommendations to build a shared writing vocabulary to support transfer, Fraizer planned and then studied a dialogic model that promotes faculty awareness of transfer. He (a) designed a student survey based on ongoing faculty conversations about their assignment and larger disciplinary writing goals; (b) administered the survey during class before, during, and after one writing project; (c) synthesized and offered for faculty conversation the "before" and "during" survey results, and then again synthesized and offered the "after" survey results; and (d) met individually with the six faculty participants to reflect on "what was interesting, surprising, or predictable in the data" as well as how their goals were being met and what they might change in the assignment process to better support students' success during the project (para. 13). Studying each of these stages, Fraizer finds that situated and ongoing faculty conversations help them use disciplinary threshold concepts to connect student and disciplinary knowledge. For example, an instructor teaching a healthcare disparities course was able to recognize mid-project that their student needed help building prior knowledge into their literature reviews. Other instructors dispensed with certain aspects of an assignment that

weren't working. Ultimately, Fraizer found that his proposed model of faculty development, which required not only awareness of students' needs but the time and space to reflect and then take action on those needs alongside a writing specialist, could more intentionally support their students' transfer of writing knowledge into disciplinary courses.

Genre Knowledge in WAC/WID Transfer

Another cluster of scholarship considers how genre knowledge, in particular, affects writing knowledge transfer across curricula or in disciplines (Bazerman, 2009; Carter et al., 2007; Clark & Hernandez, 2011; Devitt, 2007; Fraizer, 2010; Freedman, 1995; Goldschmidt, 2017; Graff, 2010; Lindenman, 2015; Nowacek, 2011; Reiff & Bawarshi, 2011; Rounsaville, 2014; Rounsaville et al., 2008; Soliday, 2011). Especially for questions about the development of disciplinary writing knowledge, genre is an important unit of analysis (how students carry genre knowledge as they move across their courses, for example) but also one that is especially complex. Devitt (2007) explores what a focus on genre uniquely reveals about the transferability of writing knowledge across disciplines. She presents a central conundrum of transfer and genre: genre must be situated but transfer requires generalization (p. 216). Even though genres are social actions stemming from repetitions, each writing event and situation in which those repetitions occur remains unique. That is to say, because genre emphasizes the situated nature of writing, the notion of genre can frustrate the notion of transfer. Her own response to this puzzle expands a transfer lens—a focus on what is or isn't transferring across contexts—beyond writing skills to the "whole genre," inclusive of writers' perceptions of the similarities of purpose across situations. Devitt explains, "genres capture the ways people categorize those unique writing events as related writing events" (p. 217). So, genres are generalizable to the extent that people perceive similarities and differences in situation and in task. Therefore, because the transferability of genres depends on writers' *perceptions* of generalizability—not just whether a genre is general in fact—studying the transfer of genre can reveal how "writing is at once unique and common, at once situated particularly in a precise writing event and perceived as similar to other writing situations" (219). Devitt uses the complexity built into genre to suggest that writing programs teach critical awareness of the phenomenon of genre for

writers' more deliberate and mindful selection among genres in future writing situations.

Devitt's recommendation that courses teach awareness of genre is a common study outcome or recommendation: that instructors should focus on explicitly teaching genre in first-year writing to support writing knowledge transfer to disciplinary courses. For example, Clark and Hernandez (2011) analyzed pre- and post-survey data as well as a final reflective essay from one writing class to understand how explicit teaching of genre theory might help students detect transfer cues (Perkins & Salomon, 1989) in multiple courses. Following Devitt (2004) and Beaufort (2007), they suggest that teaching genre awareness, rather than genre type, might help students develop transferable genre knowledge.

Similarly, Fraizer (2010) designed a study to understand how teaching for transfer strategies like genre and discourse analysis (anticipating Yancey et al., 2014), as well as reflection, support transfer across writing contexts. Specifically, he asked how these writing activities affect transfer when introduced to students not in a FYW course but afterward, and in a smaller group setting. To do this, he followed eight students from a variety of majors during the first semester *after* taking FYW, scheduling group meetings with students to intervene "at opportune developmental moments" (p. 35). These meetings included an orientation to the study, an orientation to the concepts of *reflection* and *genre analysis*, a meeting to discuss these concepts and support each other's ongoing writing from various courses, and a final meeting to reflect on the semester's writing and development. From his conversations with students, as well as a survey of 112 students and six instructors on their perceptions about FYW course content, Fraizer concluded that these strategies can support the transfer of writing knowledge, helping students see "the big picture" of their academic writing (p. 51). But, he argues, such explicit teaching of writing theory might better belong in teaching that occurs after and beyond the first-year writing classroom, with the "richest opportunities for 'bridging' and expanded conceptual thinking" occurring in conversation with other students tackling ongoing writing projects from different writing contexts (p. 52). The need to "reflect across disciplinary boundaries and generalize about what they're learning outside of the activity system of their work in progress" (p. 52) points emphatically to writing center spaces and other informal or extracurricular learning contexts

not often captured by transfer research (Grego & Thompson, 2008; Lerner, 2007; Lindenman, 2015; Nowacek, 2011; also see Chapter 9 on writing centers in this volume).

Goldschmidt (2017) also looks to genre to understand cross-disciplinary transfer. Reviewing scholarship that shows students' difficulty transferring genres from first-year writing to disciplinary courses, she asks how programs can best teach for transfer when the differences among humanities- and science-based genres discourage transfer (p. 123). She conducts ten discourse-based interviews with seniors and sophomores at the middle and end of three-course writing-intensive sequences in psychology and computer science, asking them which writing activities they perceived to be the most helpful in negotiating a writing sequence that bridged what she called humanities-based general education writing genres and science-based disciplinary genres. Her thematic analysis of interview transcripts shows that (a) students do not mindfully abstract stylistic and structural norms across first-year writing courses and science writing in their majors; and (b) this difficulty stems in part because they encounter these stylistic and structural differences in new contexts; however, (c) seniors in her study do describe internalizing science-writing norms and repurposing a previously developed sense of authorship for disciplinary contexts once they see themselves "as a member of the new community of practice" (p. 127). Therefore, her findings show that "cross-disciplinary transfer involves a conscious and consequential transformation of participants' identities as contributing members of an academic discourse community" and thus requires students understanding genres not only as situated in a community of practice but also as a type of disciplinary social action (p. 128). To accomplish this understanding, Goldschmidt recommends, like Fraizer (2010) and Carter (2007), teaching metageneric awareness in writing-intensive disciplinary courses and introducing the concept of *genre* as a construct to be observed and analyzed in a variety of contexts.

As a unit of analysis in transfer research, then, genre has been used to reveal the relationships between text and social activity in a disciplinary context, thereby showing the complexity of learning students undertake as they attempt to transfer their writing knowledge within and across courses. Bazerman (2009) helpfully reviews the distinction between genre text types associated with surface-level writing outcomes—that is, list-making associated with increased memory—and

genre processes or activities, including task frequency and duration, leading to more complex forms of learning (p. 283). He encourages this latter lens for a more robust understanding of how writing-to-learn skills transfer with students. Lindenman (2015) takes up this approach in her research on genre and transfer. Arguing that writing research often sets up domain categories—home, school, work, etc.—that miss how students forge their own generic connections, her study uses discourse-based interviews to elicit students' understandings of genre relationships, regardless of domain. Lindenman collects data through student surveys (n=319), four focus groups, and ten interviews to understand less how students transfer their writing knowledge across domains (her original research question) and more how students draw on prior knowledge, using intuited relationships among genres, to "figure out" how to compose texts. She finds eight of ten focal participants linking their texts in unconventional ways, creating "metageneric connections" based on texts' purposes, strategies, or rhetorical effect rather than on texts' learning contexts like first-year or disciplinary writing courses (para. 5); students group their texts not by where they take place but by what they do.

Lindenman's findings lead her to suggest that writing instructors support students' creation of their own "organizational schemas" that make connections among writing knowledge. She suggests that instructors could especially draw out what she calls "metageneric reasoning" through activities that ask students to map or cluster their genres, by hand or online, and offer writing opportunities that prompt students to describe their own connections among produced texts. She ultimately agrees with the scholars above that supporting students' development of metageneric reasoning may be a promising avenue to the metacognition researchers say supports transfer.

What a Transfer-Based WAC/WID Curriculum Is or Should Be

Writing studies researchers, teachers, and administrators also have proposed what WAC or WID courses and curricula based in transfer should or could look like (Boone et al., 2012; Downs & Wardle, 2007; Ford, 2012; Hall, 2006; Hayes et al., 2016; Jamieson, 2009; Lettner-Rust et al., 2007; Melzer, 2014; Miles et al., 2008; Smit, 2004; Yancey et al., 2014). Many of these studies and proposals treat transfer as "the

very heart of learning—how it occurs and how it is sustained" (Boone et al. 2012, np; also see Smit 2004, p. 119). In designing writing curricula that support student learning across or within disciplines, then, many scholars use transfer as a connective touchstone by which to measure students' development of writing knowledge over time and across curricular contexts.

In something of a manifesto on the state of composition studies in the US, Smit (2004) reviews research on writing and learning to write and concludes that nearly every aspect of writing education in college, from introductory composition courses to graduate education in composition and rhetoric to instructor development, needs to be reimagined to reflect research-based findings on writing education. Following Walvoord and McCarthy (1990), he reiterates conclusions from transfer scholarship that students are more likely to transfer writing knowledge if they can see similarities and differences in the contexts and tasks among which they are writing. To support the "institutionalized instruction" of similarities and differences in "the way writing is done in a variety of contexts" (Smit, 2004, p. 120), Smit says that writing education needs to be better and more intentionally sequenced, exposing students to "an increasing level of domain-specific knowledge" in a hierarchy of thinking and writing skills over time (p. 185). Across these courses, students will come to transfer writing knowledge only if they have constant practice and feedback in a broad range of writing activities and discourse practices. Smit argues that WAC/WID programs are the most effective curricular structure for achieving such learning goals, reminding readers to "spread the responsibility for teaching writing across the curriculum, where it belongs" (p. 213).

Others have implemented similar principles in curricular redesigns that aim to support writing knowledge transfer by redesigning single courses. For example, Ford (2012) aimed to impact a programmatic experience of writing and over a decade redesigned several aspects of a program, including course design, faculty development, student learning outcomes, and faculty joint appointments. She describes a program redesign, shaped by a pluralistic theory of expertise (Carter, 1990) and reflective awareness (Flower, 1989), that evolved over many years from a teaching relationship between technical communication and engineering into an interdisciplinary partnership aiming to support students' writing transfer among multiple instructional contexts. Program stakeholders revised junior and senior design courses

in an engineering department by creating connected assignments that "foster building" (assignments that were scaffolded for content and rhetorical knowledge) and a dialogic environment, with a technical writing specialist (Ford) evaluating and responding to assignments alongside instructors who stressed communicative components along the way. Such an instructional partnership aimed to help students become aware of audiences beyond one course, and reinforced consistent feedback on agreed-upon rhetorical strategies. Beyond the author's joint appointment, the program included a technical writing course dedicated to design students, a graduate communication course, and student/faculty designed assignment templates, which served "not only as a style and formatting guide, but as a vehicle for provoking student-faculty conversations regarding communicating their research effectively" because they offered choices in organization, formatting, and style (2012, Faculty and Student Collaboration through Template Creation, para. 4). Ford found that involving students this way, inviting them into the conversation of creating and revising programmatic templates, not only increased student motivation and buy-in, but also helped "cue students' metacognition of higher order rhetorical strategies" that she suggested could ultimately promote high-road transfer (Ford, 2012, para. 4).

Beyond redesigning single courses or lateral writing/discipline partnerships to support transfer, scholars also have reimagined bottom-to-top writing curricula, taking WAC/WID elements into account through integrated "vertical" (Haskell, 2000; Teich, 1987), unified (Hall, 2006), or "connected" (Perkins & Salomon, 2012) curricular approaches to writing education. Vertical curricular models depend on several principles related to transfer: recursion or reiteration of concepts over time and across contexts; experiential learning which affords application of concepts to new or increasingly complex situations; and sequenced learning contexts that increase in complexity (Crowley, 1998; Hall, 2006; Jamieson, 2009; Melzer, 2014; Miles et al., 2008; Smit, 2004). For example, Hall (2006) echoes Carter's (1990) understanding of disciplinary expertise, suggesting that a "unified writing curriculum" supports student learning by increasing rhetorical complexity and disciplinary specificity from first-year writing to major capstone courses. Others provide detailed descriptions and ongoing research of such curricula explicitly based in transfer at such

institutions as Dartmouth College (Boone et al., 2012) and UC Davis (Hayes et al., 2016; Melzer, 2014).

Describing the structure of and ongoing research about the Institute for Writing and Rhetoric at Dartmouth, Boone et al. (2012) report on a three-year study that sought to improve course coherence in the first-year writing program by better understanding how students transferred writing knowledge, particularly with the aid of new technologies. The research team structured the study around program and faculty development to center research on knowledge transfer in faculty conversations, creating venues for faculty to experiment with and exchange ideas about research-based approaches to teaching writing. These workshops and conversations aimed to help faculty support their students' transfer of writing knowledge, specifically transfer of rhetorical flexibility (Evolving Directions, para. 5). One innovative aspect of the program and research is use of the program's two-term sequence, which invites first-year writing instructor and first-year seminar instructor pairs to link their courses into a "cohesive learning experience" in the first year, "co-constructing learning environments that may improve students' ability to transfer writing competencies from one course context to the next" (Additional Davis Study Initiatives, para. 2). Because the team's ongoing analysis of first-year students' essays as well as student interviews supports learning research that shows students need writing concepts to be explicitly scaffolded over time, such linked experiences may increase the likelihood that students transfer prior writing knowledge into new contexts.

With an eye to Gagne's (1965) work on vertical curriculum, Melzer (2014) describes a reimagined vertical curriculum at UC Davis based on the transfer of writing knowledge. Melzer explains that a successful form of such a curriculum includes the following components: constant opportunity for student self-reflection and self-monitoring; writing practice over time and embedded in situated, domain-specific contexts; explicit teaching of academic writing threshold concepts like *revision*, *genre*, and *editing*, introduced and reinforced across contexts and over time; the creation and reinforcement of a shared campus-wide vocabulary about academic writing; and multiple opportunities for peer mentoring. He describes what these principles of a vertical transfer writing curriculum look like at UC Davis, including WAC workshops on supporting student reflection on writing and growth of metacognition; a WAC-focused sophomore composition course that

bridges to general education courses and a junior-level WID course that uses forward-reaching transfer strategies; and a shared campus meta-language about writing, reinforced through a university writing rubric, in the student writing handbook, in all course learning outcomes, and tutor-training and outreach workshops in the writing center. (See p. 86 for a comprehensive list.)

In their research on the effect of this curriculum on students' transfer of writing knowledge, Melzer's colleagues found that course learning objectives were being achieved and were aligned with syllabi, assessment portfolios, and model texts found in the course contexts and throughout the program (Hayes et al., 2016). Hayes et al.'s findings were measured through the mechanism of dynamic transfer, what they believe is a theoretical lens that can describe the interaction between inner/cognitive and outer/socially-directed approaches to student learning (Bizzell, 1982/2003, p. 392). To capture moments of dynamic transfer in student learning in their program—acts of coordination between prior knowledge and the creation of new knowledge in new contexts (Martin & Schwartz, 2013)—the researchers looked for dynamic transfer events in data collected from 728 student surveys and 14 text-based student interviews. Tracing dynamic transfer events by isolating student links that influenced the creation of new knowledge or understanding (pp. 197–8), they found that the majority of students described links between their prior writing instruction and their comfort with certain writing skills, contrasting research results like those from Wardle (2009) or Bergmann and Zepernick (2007) in which students report seeing hardly any connections between early writing coursework and later writing. The researchers speculate that these student connections—and the potential subsequent facilitation of transfer—in their study may come from the vertical articulation of the writing program as well as the "programmatic cues" it supplies students: writing assignments that ask students to reflect on prior knowledge but also into future academic careers; explicit connection to writing skill development outside of the writing program; and resources across the university that "highlight the consistent, explicit, and intentional transfer-oriented learning objectives set forth by the multi-year writing requirements" (Hayes, 2016, pp. 208–10).

INFRASTRUCTURE FOR THE DISCIPLINARY
TRANSFER OF WRITING KNOWLEDGE

This chapter, organized by the common problems or questions that motivate WAC/WID research into the transfer of writing knowledge, has reviewed scholarship about what students do or do not transfer, what instructors are or should be doing to support that transfer, how genre plays a role, and the kinds of courses or curricula that best support student transfer and learning in and across disciplines or curricular contexts. Each section shows the ways that WAC/WID concerns are bound up in the transfer of writing knowledge, with many studies addressing the perennial questions motivating research in writing studies—What should first-year writing prepare students for? How is first-year writing related to students' writing experiences before and after college? How do students develop writing knowledge over the course of a college education and through—even if they raise more questions in the process—their deepening experiences within disciplines?

To support the transfer of writing-to-learn practices that can transform writing knowledge, the reviewed scholarship shares attention to the following instructional foci: modeling and scaffolding writing activities; making writing activities relevant to students' lives including their imagined professional lives; offering frequent but relevantly paced feedback on transfer acts, deep engagement with or intentional learning about writing concepts (Bazerman, 2009; Boscolo & Mason, 2001; Graff, 2010; Wardle, 2007); fostering conversations about writing across disciplinary faculty to develop shared writing vocabulary; and making transparent and explicit (naming and teaching) the writing skills, strategies, values, and meta-cognitive activities that support transfer. Interestingly, many studies note that such metacognition is important (e.g., Ford, 2012; Lindenman, 2015) but others state that it is not essential or required (e.g., Donahue, 2016; Nowacek, 2011) for the transfer of writing knowledge.

Because of its strong affinity to research on disciplinary knowledge, future WAC/WID research focused on transfer could productively continue to call on models from outside of writing studies such as Middendorf and Pace's "Decoding the Disciplines" model (2004) to understand the role that transfer plays as students traverse the "bottle-

necks" between expert and novice thinking in a field.[16] Middendorf and Pace's model delineates a "bottleneck approach" that seeks to understand where students experience difficulty in transferring knowledge—moving a concept from one side of a bottleneck to another. In a specific disciplinary context, this looks like faculty in history discussing what counts as teaching and learning in their discipline, using a bottleneck approach to identify where students get stuck in disciplinary learning (Pace, 2011). Such local, disciplinary conversations aim to "decode" unconscious processes into conscious communication about disciplinary knowledge so that concepts can be modeled for students and assessed, in this history case via a written "letter" to a sibling about the course. The model thus assumes that disciplinary learning happens over time and across contexts and thus highlights the role transfer plays in students' acquisition of disciplinary knowledge, including writing knowledge.

One provocative line of thinking for future research is to consider how the transfer of writing knowledge can be differently conceived in a WID context if writing studies is, itself, a discipline. For example, writing about writing approaches to first-year writing are premised on the research-based conclusion that writing learning best occurs in its own disciplinary activity system, and thus first-year writing courses are a kind of WID course that teaches field-specific skills and socialization (Downs & Wardle, 2007; Wardle & Downs, 2013). In other words, what are the implications for the above approaches to transfer if first-year writing is treated as a disciplinary activity system of its own rather than a para-disciplinary course that serves general writing skills or future disciplinary skills? Treated this way, the question of transfer among FYW and disciplinary courses is one of disciplinary rather than general transfer, and future research would need to understand how the disciplinary writing knowledge of writing studies transfers or does not transfer to other disciplinary settings. Perhaps thinking of writing as a discipline itself might help us even better understand the transfer of disciplinary knowledge when it is inclusive of the discipline of writing studies as well.

In fact, this scholarship shows that WAC and WID approaches to writing education can serve as infrastructure for transfer, creating the architecture that cues students' prior knowledge, scaffolds connections

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16. See http://decodingthedisciplines.org/bibliography/ for a comprehensive list of resources on this model.

among writing genres, lays down paths for metacognition about writing knowledge, and prompts students to reflect on past, current, and future writing activities across disciplinary contexts, including first-year writing. The next chapter demonstrates the pivotal role that writing centers also play in this infrastructure.

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