

Collaborative Research Writing as Mentoring in a U.S. English Doctoral Program

Daniel V. Bommarito

Bowling Green State University, Ohio | USA

Abstract: This qualitative study investigates an approach to mentoring that offers guided practice in authentic disciplinary activities prior to the dissertation stage. The mentoring project under investigation was unique in that it was designed to double as an authentic collaborative research study and as an opportunity for professional development. Starting from the assumption that writing is a function of the activities that underlie it, this article examines the embedded practices out of which writing emerges—namely, the forms of participation taken up by the doctoral student participants during their research and writing, as well as the mentoring practices enacted alongside. Findings show that participants devoted considerable attention to negotiating individual roles and responsibilities throughout the project and to negotiating emerging research objectives in response to a variety of unexpected obstacles posed by the research environment. Additionally, participants encountered significant difficulties constructing claims in the collaborative setting, owing in part to their status as disciplinary newcomers. Findings also show that the design of the collaborative project helped facilitate and distribute mentoring across the diverse research team in productive ways.

Keywords: collaboration, doctoral education, research writing



Bommarito, D. V. (2015). Collaborative research writing as mentoring in a u.s. english doctoral program. *Journal of Writing Research*, 8(2), p. 267-299. doi 10.17239/jowr-2016.08.02.04

Contact: Daniel V. Bommarito, Bowling Green State University, Department of English, Bowling Green, OH, 43403 | USA – dbommar@bgsu.edu

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1. Introduction

In the context of doctoral education, writing and collaboration are indissolubly linked, as writing is one of the primary modes in which emerging scholars interact with those more established and, over time, become contributors to ongoing disciplinary conversations (Lonka, Chow, Keskinen, Hakkarainen, Sandström, and Pyhältö, 2014). This social view, which links individual ability with forms of participation in communities of practice (Lave & Wenger, 1991), posits writing not as a discrete, static set of skills, but as a dynamic and adaptive set of practices necessarily bound up with the salient activities of a particular scholarly community. Writing at the doctoral level, then, is a material reflection of a complex, long-term, and inherently collaborative process of enculturation (Berkenkotter, Huckin, & Ackerman, 1988; Casanave, 2002; Prior, 1998).

Although research from a variety of fields has highlighted the complexity of doctoral writing development, relatively few systems of support have taken root across the disciplines (Caplan & Cox, 2016; Simpson, 2013). As Paré (2011) has noted, given the centrality of writing to scholarly development, “it seems surprising that so little explicit attention has been paid to writing development in doctoral education” (p. 60). Indeed, much recent scholarship has acknowledged this lack of attention and issued calls for increased support, including work at the intersection of applied linguistics and writing studies (Ding, 2008; Phillips, 2016; Simpson, 2013, 2016), education (Badenhorst & Guerin, 2016; Aitchison & Paré, 2012; Paré, 2011; Starke-Meyerring, 2011), and U.S. composition studies (Brooks-Gillies, Garcia, Kim, Manthey, & Smith, 2015; Micciche & Carr, 2011).

A recurring theme among these critiques is the need for “systemic” forms of support more integral than the occasional handbook or workshop (Kamler & Thomson, 2008; Rose & McClafferty, 2001). For example, Starke-Meyerring (2011) argues that meeting the unique challenges of doctoral writing calls for “a larger systemic cultural shift in research institutions” that goes beyond “some added ‘assistance’ or ‘support’ for supervisors and students” (p. 92). Rather, she sees the need for “infusing the doctoral curriculum with a solid research base that examines the roles of writing and discourse in the production of knowledge” (p. 93). Seeking to effect this kind of systemic shift in doctoral education, Walker, Golde, Jones, Bueschel, and Hutchings (2008) advocate a model of “progressive development,” which invites students to engage in authentic research practices prior to the sometimes daunting task of conducting independent research for a thesis or dissertation, a task that can leave many students feeling stranded if unprepared (p. 65). They suggest that, by gaining access to research practices during early stages of development, doctoral students are more likely to acquire the habits of mind constituent of a professional disciplinary identity as well as the discursive practices through which that identity is made visible to the broader community.

The present article contributes to discussions surrounding doctoral pedagogy by investigating an approach to mentoring that offers guided practice in authentic disciplinary activities prior to the dissertation stage. The mentoring project under investigation in this article was unique in that it was designed to double as an authentic collaborative research study and as an opportunity for professional development. Starting from the assumption that writing is a function of the activities that underlie it, I aim in this article to examine the practices out of which writing emerges—namely, the forms of participation taken up by the doctoral student participants during their research and the mentoring practices enacted alongside.

2. Literature Review

2.1 Doctoral Writing and Its Paradoxes

Doctoral writing is unique in its complexity, purposes, and function as a site of inquiry and identity formation. Doctoral students must learn to navigate large bodies of information and diverse genres as they produce written products over extended periods of time, frequently revising in response to external feedback and new understandings (Allison et al., 1998). Unlike at the undergraduate level, where writing is typically used to learn content and prepare for work in other domains, writing at the doctoral level is preparation for work in the very fields in which it occurs, often for an academic career (Brooks-Gillies et al., 2015). As a result, written discourse becomes a highly contested site of transformation, in terms of constructing both disciplinary knowledge and professional identities (Starke-Meyerring, 2011).

Two paradoxes underlie these complexities (Starke-Meyerring, 2011). First, because writing is tethered to participation in complex disciplinary practices, much of what must be learned is deeply embedded within the commonplaces of the community. As Lonka et al. (2014) argue, “Learning academic writing is difficult because it requires adopting partially tacit and implicit knowledge across extended socialization to disciplinary practices” (p. 246). Similarly, Paré, Starke-Meyerring, and McAlpine (2011) contend that, while the genres doctoral students must learn facilitate communication among established community members, they exist largely in the “tacit realm,” which renders them “less accessible to critical examination and questioning” (p. 223). Newcomers are tasked with deciphering practices and genres that appear “universal to long-time members” (p. 223). Learning to write at the doctoral level, then, calls for sustained access to practices often hidden from view. The difficulty for doctoral mentors lies in their ability to articulate that which is tacit and learned over long periods of time.

A second paradox is that graduate students are expected not only to learn the knowledge that is taken for granted within a community, but also to produce knowledge not already circulating. That is, a crucial element of graduate education is the ability to produce “novelty” through research and writing (Sullivan, 1996, p. 224).

For mentors, this paradox poses a distinct practical challenge. If a mark of doctoral writing is novelty, then mentors cannot know beforehand what it is precisely that students must learn; thus, learning experiences cannot always be precisely anticipated and planned for. The challenge for mentors is finding ways to create conditions in which students inhabit problem spaces where no clear solutions exist while, at the same time, to provide the appropriate support structures amidst the opacity.

2.2 Collaboration and Distributed Mentorship

Viewing writing as a form of participation in disciplinary activity suggests the importance of collaboration in doctoral education. Indeed, as Littlefield, Taddei, and Radosh (2015) put it, “collaboration is a key component to academic success and student performance, especially within higher education doctoral programs” (p. 132). A central site of collaboration in doctoral education is the relationship between student and faculty mentor. Although doctoral students are moving toward independence as researchers, ongoing consultation with the mentors is a key step toward such independence. Paré et al., (2011), for example, show how the close relationship between student and advisor during the dissertation stage plays a crucial role in students’ ability to “locate themselves appropriately and effectively in the rhetorical situations that produce their discipline’s knowledge” (p. 216). Similarly, Ding (2008) describes the ways collaborating with faculty can help students gain broader awareness of the contexts in which writing circulates and the particular practices necessary for participating in those contexts. Additionally, Prior (1995) illustrates the complex ways collaboration occurs between students and faculty through recurring revisions of written discourse, which have material consequences on the written products and the learners themselves. These studies point to the highly formative role of faculty-student collaboration, a relationship that has the potential to extend well beyond graduation (Simpson & Matsuda, 2008).

Another important site of collaboration is the relationship among peers. Scholarship on socialization in second language (L2) settings, for example, has shown a link between building peer networks and long-term success (Braine, 2002; Ferenz, 2005; Seloni, 2012). Such success derives in part from relationships in which more experienced members of a community provide informal support for less experienced, novice members, much like the collaborative apprentice relationships described by Lave and Wenger (1991).

2.3 Designs for and Limits of Doctoral Writing Support

Research on doctoral-level pedagogies in research writing have focused on courses dedicated to writing support in both L1 and L2 contexts (Charles, 2007; Fairbanks & Dias, 2016; Grav & Cayley, 2015; Micciche & Carr, 2011; Sundstrom, 2014), writing groups (Aitchison, 2009; Busl, Donnelly, & Capdevielle, 2015; Lee & Golde, 2013), and various other forms of administrative programming such as writing centers and workshops (Allison et al., 1998; Autrey & Carter, 2015; Gillespie, 2007; Vorbies, 2015).

However, some features of existing support structures may limit the potential benefits for doctoral students. One potentially limiting feature is that the point of instruction is often detached from a writer's individual purpose (Bawarshi & Reiff, 2010; Tardy, 2009), which can limit students' ability to situate themselves within a disciplinary context. A second limiting feature is that writers and mentors often tend not to have an equal stake in the outcomes of writing. Whether in a tutoring session, workshop, or dedicated writing course, the mentor generally provides support on a project for which the student holds sole ownership. However, when mentors and students share a stake in a project—when both have skin in the game, as it were—students are more likely to access authentic disciplinary practices that are often hidden from view. As Stillman-Webb (2016) suggests, mentoring in writing might be strongest “where faculty and students both have something at stake in the writing” (p. 272).

3. The Present Study

This qualitative study explored the ways in which collaborative research and writing, under the guidance of an experienced mentor, functioned as a learning opportunity for doctoral students prior to the dissertation stage. Additionally, by investigating interwoven practices of research, writing, and mentoring, this study also sought to gain a better understanding of the kinds of support systems that stand to benefit doctoral students. With these goals in mind, and in light of the paradoxes described above, the research questions motivating the present study are:

1. What embedded practices do doctoral students take up by virtue of their “legitimate participation” in authentic research and writing?
2. How do doctoral students, as newcomers to a disciplinary community, construct new knowledge claims?
3. How is mentoring distributed across the research team?

3.1 Research Context and Participants

To pursue these questions, I observed a team of six researchers—one experienced mentor and five doctoral students—as they conducted a two-year collaborative study in their home institution, a large research university in the United States. The experienced mentor, who was also the students' doctoral advisor, initiated the collaborative research project for two distinct purposes. The first purpose was to provide mentoring opportunities for doctoral students by working closely with them on a research project that would eventually be reported in writing. The second purpose was to investigate an authentic research issue related to the mentor's scholarly agenda. Specifically, the mentor set out to investigate the experiences of Chinese undergraduate students enrolled in university writing classes.[1] To learn about these students' experiences, the mentor planned to conduct interviews with them as well as their writing teachers. Thus, the mentor set up the collaborative research project to achieve dual purposes—to

provide mentoring opportunities for doctoral students by collaboratively investigating the experiences of Chinese undergraduate writers.

The six participants in the present study, indicated by pseudonyms in Table 1, were members of a U.S. university English department that housed a doctoral program in both applied linguistics and rhetoric and composition. The mentor, Professor Maddox, is an English professor, with specializations in applied linguistics and rhetoric and composition. An experienced researcher and mentor, Maddox collaborates often with doctoral students to help them professionalize as scholars. Among the five doctoral students Maddox invited to collaborate, four were native speakers of Mandarin Chinese: Vivian and Daisy, who spoke a Mainland variety, and Chloe and Sophia, who spoke a Taiwanese variety. Maddox set up the collaborative project so that they would be able to draw on their linguistic knowledge to conduct interviews with the Chinese undergraduate writers and analyze the data, which would also be in Chinese. The fifth doctoral student, Joshua, was invited to the study because of his interests in writing teacher development and qualitative methods. Given his background, Joshua was invited to the collaborative project to conduct interviews with the writing teachers of the Chinese undergraduate students and analyze the resulting data.

Prior to the study, some of the doctoral students had collaborated with Maddox in various ways. Joshua had co-authored a book chapter with Maddox, while Daisy, Chloe, and Sophia had played small roles on conference presentations led by Maddox. The collaborative project itself was not connected to any degree requirements and was thus carried out on the students' and mentor's own time. Despite being disconnected from formal institutional requirements, the six participants carried out their work within the university, meeting on campus regularly. A few months into the collaborative research project, the most advanced student, Vivian, graduated and left the project as she moved into a new job.

3.2 Data Collection

My study of the collaborative research project was informed by semi-structured participant interviews, observations of team meetings, and a collection of written texts produced by team members (see Tables 2 and 3 below). I conducted a total of 12 semi-structured interviews, roughly an hour long each, with the doctoral student participants at two points during the collaborative research project—once about two months into the project and again just over a year. Additionally, I conducted one interview with Maddox about midway through the project. All interviews were audio recorded, transcribed, and reviewed for accuracy. The purpose of these interviews was to elicit information about the inner-workings of the collaborative process, the challenges faced, and team members' perceptions of their learning. While I entered each interview with a script, I allowed participants' responses to influence the direction of the interview and my frequent follow-up questions. During the second interview with doctoral students, I used a text-based approach to elicit insider commentary about the writing process.

Table 1. Participant Information

Participant	Degree Program	Year at Project Start	Gender	Research Experience	Languages
Maddox	Professor of English, specialist in Applied Linguistics and Composition		Male	Expert	English; Japanese; Chinese (reading proficiency)
Vivian	Applied Linguistics emphasis	Fifth-year doctoral student	Female	Intermediate	English; Chinese (Mainland variety)
Joshua	Applied Linguistics emphasis	Third-year doctoral student	Male	Intermediate	English; Chinese (reading proficiency)
Daisy	Rhetoric and Composition emphasis	Third-year doctoral student	Female	Novice	English; Chinese (Mainland variety)
Chloe	Rhetoric and Composition emphasis	Third-year doctoral student	Female	Novice	English; Chinese (Taiwanese variety)
Sophia	Rhetoric and Composition emphasis	Third-year doctoral student	Female	Novice	English; Chinese (Taiwanese variety)

Using written texts as a prompt, I asked the doctoral students to point out aspects they found to be salient and to describe their experience surrounding those portions of the texts. Additionally, beyond the interviews themselves, I maintained contact with the students throughout the study through occasional conversations in person and over email, which allowed me to be updated on the team's progress and to clarify my understanding of emerging issues.

A significant source of data came from my observations of team meetings, which took place roughly once per month, during which the research team discussed findings from their ongoing analysis and other procedural issues that arose during the project. I observed fifteen meetings, each of which ranged in duration from one and a half hours to three hours. Of those fifteen meetings, ten were audio recorded and transcribed,

using both manual methods and Dragon talk-to-text software, and reviewed for accuracy. For pragmatic reasons, I ceased observations about a year and a half into the project, despite the fact that the team continued to meet (albeit less frequently), so that I could direct my energies toward data analysis.

I also collected various forms of writing, including team-wide email correspondence, research materials, such as data collection instruments and recruitment letters, and drafts of disciplinary genres that were produced with an eye toward eventual publication. To collect email correspondence, I was included on team-wide emails, which I saved and archived. The majority of these messages were sent in the first four months of the project, as the team collaborated online. To collect the team's written drafts of research materials, I periodically saved and archived electronic texts the team had produced using an online collaborative wiki tool—namely, Google Documents (Anderson et al., 2012). The decision to save and archive these drafts at periodic intervals was made based on natural breaks in the team's drafting process, which commonly came when the team paused to solicit feedback from Maddox, the faculty mentor. Finally, I also collected drafts of various texts the team wrote to support the production of a culminating research report, including coding schemes, outlines, working bibliographies, and various sections of the research report. The written materials were circulated by team members during meetings as the basis for discussion; when drafts were referenced but not shared during meetings, I requested them from team members directly.

Table 2. Participant Interview Schedule

Participant	Interview Dates
Maddox	12/16/2013
Vivian	11/14/2012 5/2/2013*
Joshua	11/14/2012 1/23/2014
Daisy	11/19/2012 1/16/2014 1/23/2014
Chloe	11/15/2012 1/24/2014
Sophia	11/15/2012 2/5/2014

*interview not audio recorded

Table 3. Schedule of Team Meetings and Corresponding Written Texts Collected

Team Meetings	Written Texts
Meeting #1: 10/07/2012*	Drafts of data collection instruments, recruitment letters, and application to local institutional review board Email correspondence (206 team-wide email messages, the bulk of which were sent between 9/27/2012 and 1/26/2013 as the team collaborated online)
Meeting #2: 1/26/2013*	
Meeting #3: 3/10/2013*	
Meeting #4: 4/24/2013	Overview of initial findings, including coding scheme and excerpts from interviews with teacher participants (Joshua) Overview of initial findings, including demographic information and coding scheme based on interviews with student participants (Vivian, Daisy, Chloe, Sophia)
Meeting #5: 5/02/2013	
Meeting #6: 8/30/2013	Coding scheme, supplemented with excerpts from interviews with student participants (Daisy, Chloe) Complete draft of chapter developed as a spin-off project using data from teacher interviews (Joshua, Maddox)
Meeting #7: 9/12/2013	Revised coding scheme, based on interviews with students (Daisy, Chloe)
Meeting #8: 9/24/2013	Draft of introduction and methods section for planned research article (Joshua) Outline of results section for planned research article (Daisy, Chloe)
Meeting #9: 10/29/2013	Revised outline of the results section for planned article (Daisy, Chloe) Working bibliography for literature review (Joshua)
Meeting #10: 11/26/2013	Revised introduction and methods section for planned article (Joshua) Revised working bibliography for literature review (Joshua) Revised outline of results section for planned article (Daisy, Chloe)
Meeting #11: 12/16/2013	
Meeting #12: 1/31/2014	Revised introduction and full draft of literature review and methods sections for planned article (Joshua, Sophia)

Meeting #13: 2/13/2014	Revised results section for planned article (Daisy, Chloe)
Meeting #14: 10/9/2014*	Overview of chapters for planned monograph (Joshua) Draft of chapter for planned monograph (Joshua) Outline and preliminary draft of chapter for planned monograph (Daisy) Outline and preliminary draft of chapter for planned monograph (Chloe)
Meeting #15: 12/17/2014*	Outline of introduction and literature review for planned monograph (Sophia) Full draft of chapter for planned monograph (Daisy) Full draft of chapter for planned monograph (Chloe) Full draft of chapter for planned monograph (Joshua)

*meeting not audio recorded

3.3 Analysis

The analysis of the data set followed an emergent, inductive approach, focusing initially on the data set as a whole and then narrowing in on specific research questions. An initial step was to arrange the data in chronological order, which allowed me to track the unfolding of the team's process and to begin forming a general understanding of salient issues. After gaining familiarity with the data set as a whole, I used NVivo qualitative analysis software to conduct a more focused reading with an eye toward the motivating research questions. To begin identifying practices taken up by team members that were embedded in the situated research and writing process, I developed categories that described the sequence of collective actions taken by the team (including four overarching categories, "designing the research study," "recruiting participants and collecting data," "analyzing and interpreting data," and "producing a research report"). Based on this listing of the team's collective actions, I identified particular actions that team members found to be unexpected or challenging for one reason or another. Actions were deemed to be "embedded" if they emerged as a direct result of having conducted authentic research and if they tended to be de-emphasized or overlooked in literature on research methods.

To determine the team's process of constructing new knowledge claims, I targeted a narrower subset of the data. Specifically, I focused on transcripts from team meetings #6 through #13 as well as written drafts developed during that period. To facilitate analysis, I divided the text of each transcript by topic. Data from the second round of interviews was also used, but in a supplemental capacity. The decision to narrow the focus of analysis was done for three reasons. First, team meeting #6 came just after a long holiday break, during which team members developed a renewed sense of clarity of purpose for the project. Because the participants had a clear sense of purpose, I was able to track more easily the team's process of developing insights, claims, and arguments in subsequent meetings. Second, just prior to the summer holiday break,

Vivian graduated and ceased to be part of the research team; examining the team's process after her departure was a way to view that process under more stable conditions, without shifts in personnel. Third, after meeting #13, the team changed the focus of their project, which significantly altered their work patterns. The period between meetings #6 through #13, then, offered me the clearest vantage from which to examine the collaborative construction of claims and attempts at developing a sustained argument.

To investigate the forms of mentoring that occurred, analysis focused on interview responses that dealt directly with questions concerning mentorship (e.g., "Please describe the directions and mentoring you have received from the lead investigator throughout this project" and "What guidance and/or mentoring have you received from your peers on this project thus far?"). Focusing on interview data, I identified general categories based on who was giving or receiving mentoring: either faculty-to-student or student-to-student, as well as a student-to-scholarly text category to capture instances in which students mentioned turning to published scholarship to aid their writing process. I then compared participants' interview responses with transcripts from team meetings, looking for evidence to corroborate, confound, or otherwise contextualize participants' descriptions.

3.4 Ethical Considerations and Researcher Positioning

Because the doctoral student participants were advisees of the faculty mentor, it was essential to avoid disclosing any information that may have harmed their professional relationships. Recognizing the potential sensitivity of the data collected through interviews, I shared all interview transcripts with the doctoral students to provide an opportunity to redact any information they did not want public. For the same reason, I remained careful throughout to keep information anonymous.

A related concern was that I entered the study having established prior relationships with four of the six participants. As a doctoral student, I had taken classes with three of the participants as well as classes with the faculty mentor. As a result of these prior relationships, I was invited to observe the collaborative project, and team members were receptive to participating in my study. The research team voluntarily agreed to participate in the study, which was reviewed and endorsed by the local institutional review board. While my familiarity with the participants initially led me to keep a distance from them, in an effort to avoid influencing their work, I soon found that my positioning afforded me a unique perspective, which some participants wanted to learn from. Informed by research on formative intervention (Engeström, 2011), I eventually decided that it was appropriate to maintain open communication with the participants, occasionally sharing my interpretations both to ensure their accuracy and to create opportunities for participants to pose questions about emerging findings. As a result, this study does not intend to reflect an objectivist research orientation. Instead, recognizing my own subjectivity and inevitable influence on the research context, I

worked to develop interpretations that would likely be of use to the participants' ongoing learning.

4. Findings

4.1 Accessing Embedded Practices

By participating in authentic research and writing, the doctoral student team was positioned to confront practices embedded in the dynamic and ever-evolving context of research. Specifically, the doctoral students negotiated their positioning and ability to contribute in light of their individual skills and expertises, while also navigating a tacit power dynamic that influenced the ways in which individual members made their respective abilities visible to the rest of the group. The doctoral students also confronted constraints in the research environment that demanded adaptive responses, cognitive flexibility, and a willingness to modify the research objectives.

Negotiating Roles and Responsibilities

A central concern for many of the doctoral students was determining the manner in which they could contribute to the team's collective efforts. However, because roles and responsibilities were not explicitly delineated at the outset of the study, the doctoral team felt confusion about how to position themselves in relation to others. An interview comment by Chloe captured the uncertainty felt by others on the team:

We were not clear about who plays what kind of a role. So that's a question I have. We were kind of waiting for someone to initiate or take charge of something. This was my fear at the beginning about delegation or who is in charge of what. This is sometimes I feel kind of confused.

One way in which team members responded to this confusion was by considering the degree to which their skills and expertises stood to advance the team's shared goals. This type of consideration was evident as team members drafted research materials and negotiated peer feedback procedures, particularly when it came to translating between English and Chinese. For example, while four of the doctoral students were invited to the project by virtue of their linguistic expertise, the differences among their dialects affected how some members came to understand their roles. Because the target population the doctoral team hoped to recruit would likely speak a Mainland variety of Chinese, both Chloe and Sophia, who spoke a Taiwanese variety of Chinese, elected to cede decision-making authority to Vivian and Daisy, who spoke a Mainland variety. However, the decision to cede authority was made alongside a desire to make substantive contributions to the team's efforts. In an interview, Sophia pointed to an internal conflict she felt as she negotiated, on one hand, her desire to contribute and, on the other, her desire to advance the project:

The participants were Chinese, so we were shooting for Chinese interviewees. So that's why I felt like sometimes for Taiwanese partners, I feel limited contributing to this. I think I did, but we had so many disagreements for translating. So that's the moment I don't want to insist because I don't want to make things slower, even though I'm not contributing.

While Sophia wanted to bring her considerable linguistic resources to bear, she also found that those resources were valuable insofar as they allowed the team to achieve their goals. As a result of this negotiation, Sophia (as well as Chloe) found herself occupying an unexpected position on the research team, as she receded to the background of the collective activity.

Contributing to the project also involved navigating a tacit power structure. Joshua, for example, noted that decision-making was not always evenly distributed, suggesting that seniority and experience were factors contributing to the extent of one's participation. In an interview, he described his experience of the power dynamic:

And that power relationship is really tricky because there is a power relationship in this study. You know Vivian is about to graduate, and she has the most experience, and I feel that we are all deferring to her. Vivian knows a lot and we willingly and appreciatively defer to her. But when there's a question and she has an answer, we go with her answer, even if it's on my part, even if it's on something that she is not looking at. There is inherent power differential that really changed how much editing you can do, and how much arguing we can do.

As a result of this dynamic, participants' voices were arranged in ways that some found limiting at times. As the team developed research materials, for example, Joshua chose not to provide peer feedback on portions of the project for which he did not hold direct responsibility, despite his considerable experience and ability. Similarly, Chloe felt limited in her ability to shape aspects of the project due to her sense of her limited authority. Believing the team's work patterns to be inefficient during the early stages of the project, Chloe considered stepping in to make suggestions on improving efficiency, but she ultimately elected to refrain from intervening. In an interview, she described her reticence: "I feel like I'm not the person who can say 'Guys, let's just meet.' [...] I don't think it's appropriate for me to like go to his [Maddox's] office, 'Hey, let's talk about our collaboration.'" For Chloe, as well as other team members, participation involved not only measuring one's skills and expertise against the aims of the collective, but also considering one's positioning with respect to a felt-sense of tacit structures of authority.

Negotiating Unique Demands of the Research Environment

Beyond group dynamics, the doctoral students also confronted the need to adapt to unexpected demands of the research environment. The most apparent demands came during recruitment, which prompted a comprehensive re-thinking of the study design.

By attending to unexpected circumstances and developing adaptive responses, the research team participated in the kind of situated decision-making called for by the dynamic nature of research.

A central turning point in the collaborative project came during recruitment, as few volunteered to participate in the study. This issue set in motion a number of collective actions by the team aimed at revising the study design, securing participants, and ultimately keeping the study on course, albeit in altered form. After repeated failed attempts to recruit student participants via email, the team met in person to discuss alternative strategies. Specifically, members discussed the possibility of contacting writing teachers directly to see if they might be able to identify students taught in the previous semester, a move that could have allowed the team to conduct post hoc interviews with students. Members also considered visiting writing classrooms to recruit new students in person, as reflected in an email message, sent from Vivian to Maddox on behalf of the other group members:

We have not heard from any students after sending out three invitations in the past month. We were thinking maybe we need to change our current way of recruitment. Instead of emailing the targeted students, we were thinking to contact all relevant instructors for a 5-minute advertisement in their classes to recruit Chinese students.

To supplement this in-person approach, the team also proposed speaking to students both in English and in Chinese as a way to encourage student participation.

Despite these attempts, however, no students falling within the target demographic volunteered. The most drastic revision of recruitment procedures came, then, after the research team decided to open up recruitment to all Chinese-speaking undergraduate students, rather than only those who were perceived by their teachers to be struggling with writing in English. To enact this shift, the team returned to the original data collection instruments and revised them to account for the intended change in participant population. The wording on recruitment scripts and interview guides was revised to de-emphasize the original focus on writing struggles and, instead, to include more open-ended issues concerning students' general experience writing in a U.S. university. Widening the participant pool and visiting writing classes in person to recruit ultimately yielded 23 student participants, which was significantly more than the 6-8 originally expected.

Negotiating Multiple Evolving Research Objectives and Genres

Responding to the unique conditions of the research environment brought with it a need to re-negotiate research objectives, a task which occurred multiple times during the course of the project. As the project progressed, team members, often led by Maddox, considered a variety of ways to approach the data and present it in written genres. Specifically, the team worked to develop new research questions, given the

altered data collection procedures, as well as a variety of genres—a research article, book chapter, dissertation, monograph, and conference proposal—all drawing from the same data collection. While not all of these goals was achieved, the discussions surrounding these shifting forms of disciplinary action illuminated practices that tend to be hidden from view.

Altering data collection procedures created the need to develop a new research question, one that emerged from the data itself rather than one that was articulated clearly beforehand. The prospect of shifting the research question, however, was a challenge for some team members, for both practical and conceptual reasons. Joshua, for example, described the challenge as stemming from the fact that the team never did explicitly re-articulate new research objectives. In an interview, Joshua described how shifting the study purpose led to difficulties during analysis:

We did not know what the new goals were. [...] How do you categorize and analyze data based on a previous goal when no new goals have been [stated]? You know, we read the data and look for salient themes, but the salient themes have to answer a question that was never drafted. So that became tricky.

Whereas Joshua struggled with the practical consequences of developing new goals, Chloe struggled with the very notion of analyzing data under a new purpose. For Chloe, shifting the focus of the study seemed to her to render much of the data unusable. This assumption was evident when she was asked to synthesize portions of the data in order to answer an altogether new research question. In response, Chloe indicated that she could not synthesize the data because the newly developed question at issue was not explicitly asked during the interviews. This assumption kept Chloe from approaching data with the flexibility demanded by the dynamic circumstances of the project.

Widening the participant pool also created the opportunity to develop a spin-off project. Because of the shift in focus, portions of the data had indeed become unusable, since the teacher data did not complement the student data as originally envisioned. In response, Maddox and Joshua worked together to formulate a new research question focusing exclusively on the teacher data and to develop a book chapter as a distinct project. To carry out this spin-off project, Joshua culled new research literature to contextualize the study and conducted a new analysis based on questions associated with the construction of teacher identity. The piece was developed concurrently with the team-based collaborative project and was eventually published.

Nearly a year into the project, the research team made two additional shifts that significantly affected the direction of the project. First, Maddox offered the opportunity for team members to use the collaboratively collected data to develop dissertation projects, an offer which was taken up by both Chloe and Daisy. (Both Sophia and Joshua elected not to develop dissertations based on the collaborative data because they had already staked out relatively clear research plans of their own, continuing work they had done in the previous year.) The impetus for this suggestion, as Maddox

noted in an interview, was that team members were spending so much time on the project that he was afraid they might not be making enough progress completing their own individual graduation requirements. To resolve this issue, Maddox sent a lengthy email to the doctoral students in which he described three possible approaches that could be the basis for dissertation projects and provided a rationale for how the different projects could be carried out without overlap.

In another significant shift, Maddox also proposed that the team develop a monograph instead of, or in addition to, the originally planned research article. This proposal was made to account for the unexpectedly large data set the team had at their disposal. During the team meeting #9 in which he proposed the monograph, Maddox compared features of the different genres at issue—research article, dissertation, and monograph—including how various sections and chapters might be divided up and how different topics might be emphasized or de-emphasized in ways befitting particular genre conventions. In relation to this shift, the team frequently discussed differences among citation and formatting styles that might be used in various contexts. Also at issue for Maddox were logistical concerns regarding how the team could produce a monograph given practical constraints. He suggested that the options were “not mutually exclusive,” meaning that the team could publish a research article and then return to the monograph, with the dissertation writers contributing as lead authors. By the time I stopped collecting data, each team member had developed a chapter for the planned monograph, but that project never resulted in a polished final product, as team members had to turn their attention away from the collaborative project. For similar reasons, the team also did not generate a final product of the research article originally planned.

A concern unique to collaborative research arose when Chloe developed, independently of the rest of the group, a conference proposal that used data from the collaborative study. Recalling an early statement by Maddox indicating that team members could use data for their own individual purposes, Chloe submitted a proposal to a national conference with the intention of conducting a new analysis. However, some team members found this move troubling, since the rest of the group was not consulted beforehand and because other team members had contributed significant time and effort to data collection. To resolve the issue, but only after the proposal was accepted, Chloe shared her rationale with the rest of the group during a team meeting, which led to a discussion about appropriate procedures for using and presenting shared data. Specifically, Maddox suggested that all team members consult the group before taking such independent action.

4.2 Constructing New Knowledge Claims

To construct new claims, the research team worked collaboratively to invent insights based on the raw data and to situate those insights amidst various elements of the disciplinary context. As insights became increasingly contextualized, it was primarily the more experienced members of the team—namely, Maddox and Joshua—who

contributed to idea development. Less experienced team members, that is, struggled to position insights beyond immediate concerns. This section describes and illustrates this development process and discusses obstacles that occurred along the way.

Inventing and Contextualizing Data-Driven Insights

Inventing data-driven insights involved posing and critiquing tentative generalizations about the data set. Such generalizations, which were shared and developed during team meetings, often came in the form of propositions, such as: “the students seem to want grammar instruction” and “most students don’t find the writing course challenging.” Generalizations also emerged as articulations of conflicts, in which multiple data points were used to highlight an apparent dissonance. One instance, for example, came during meeting #9 when Joshua pointed out an apparent conflict in the way student participants talked about the value of their writing classes:

They value that they can now write more because they feel that that’s useful for the future writing tasks, but then when asked if they would take it again they say, ‘No, I’m ok.’ So there’s a contradiction there in trying to interpret what students find useful or how students feel that the class is useful.

Whether stated as propositions or as conflicts, generalizations were a way for team members to call attention to an issue that seemed to demand additional examination. Substantial effort was also devoted to critiquing generalizations, which involved breaking down and rebuilding generalizations until they adequately reflected what team members were finding in the data.

A crucial next step in the construction of claims involved moving generalizations drawn from the data set into new territory. That is, data-driven generalizations prepared the ground for more outward-looking interpretive gestures that positioned emerging insights amidst broader disciplinary concerns. Such gestures consisted of linking generalizations to disciplinary subject matter and experiences—including existing scholarship and team members’ prior professional experiences—and to elements of the rhetorical situation—including potential audiences, potential implications, evolving research purposes, and evolving argument structure. These contextual elements served as resources for invention insofar as they helped, through dialectical interplay, to shape and stabilize emerging claims.

An Illustration

To illustrate the process by which claims were constructed, I turn to an extended example that shows how team members developed a data-driven generalization and how that generalization came to be shaped and stabilized by elements of the disciplinary context. In this example, Chloe and Daisy work with Maddox to articulate a generalization based on the data, which is then taken up and examined through the

lens of other contextual features by Maddox and Joshua. Maddox develops the insight by linking it to the notions of argument structure and potential implications, while Joshua develops the insight by linking it to his disciplinary knowledge, allowing him to articulate the team's scholarly contributions. The product of this dialogic display is a new claim that becomes stabilized through a subtle understanding of its relationship to the needs of a particular audience and its place amidst relevant scholarship.

The data-driven insight is initiated by Chloe during team meeting #8. She states that the students she interviewed, when asked about their goals for the writing class, seemed to focus on different issues than did their teachers. Chloe's generalization is elaborated by Daisy and then brought to a point of stasis by Maddox who reinforces and amplifies the generalization.

Chloe: So it's like what students are focusing on is not like what the teachers are. I'm still trying to make the connection.

Daisy: Yeah, it seems like what they learned in the writing course are not necessarily can solve the problems that they are really having, their difficulties in writing, because a lot of them mention in the writing course they realize, "OK, writing is a process"—and then, for instance, the ideas, organization, structure. But when asked, "OK, what's the difficulties that you have in the writing?" a lot of students comment, "OK, the paper is too long, and then I can't really express myself in English." So it seems like there is a, I don't know, still like a generalized gap.

Maddox: What was the gap again?

Daisy: So it's like when we ask students over what you learned in the writing course, they said that "OK, because in China we study grammar, but here we realize, OK, writing is a process, or the teacher reinforced that idea in the class." But when we ask, "OK, what's the difficulties that you have with your writing?" They will say, "I can't really express myself."

Chloe: Yeah, students said that teachers help them develop their ideas or help them get their organization better, but they didn't say that teachers help them with sentence structure and grammar.

Daisy: And then a lot of students say, "I want more instructions from my teachers, for instance, how I can have more sentence variety, and then how exactly to write this in my sentences?"

Maddox: That gap is actually what we are looking for. Teachers are doing one thing, and students understand it, they appreciated it, but what students feel that they need are different. And teachers often say, "Well, you need to vary your sentence structures." "So give me more sentence structures so I can vary them," right? But that language instruction part is missing.

This data-driven insight—that writing teachers are not meeting students’ desire for local-level instruction in grammar and style—becomes further developed as team members consider it from a broader disciplinary perspective. For example, Maddox pushes team members to consider how the insight might be represented as a written argument with implications for a particular audience. After identifying examples of the generalization in the data with Chloe and Daisy, Maddox says,

What you just said are two perfect examples to illustrate that generalization. You need to develop many chunks of these explanations. Then you bring that to the context of “what is it that students want, and how is it different from what the teachers are actually doing, and how is it different from what the teachers are expecting?” And if you can identify that, then one of the conclusions that we can draw—and this is a really helpful conclusion—is the teachers are expecting one thing, and they are teaching something different. But they are not teaching what the students actually need. [...] And the implication is clear. Writing teachers need to match their expected outcomes and what they actually teach.

Here, Maddox is actively encouraging Chloe and Daisy to envision the insight as part of an emerging argument that will have practical consequences for a real audience.

During the same meeting, Joshua also pushes the generalization into the wider disciplinary world. He does so by considering the ways in which the collaborative study contributes to ongoing dialogue in the scholarly literature he has encountered. Continuing the discussion, Joshua and other team members puzzle over why students might prefer grammar instruction, which they surmise may be an effect of prior education in China that tends to pair writing with language-learning and the explicit teaching of grammar. Joshua points out that other studies have also found that second language writing students often desire additional grammar instruction in writing, and he suggests a way in which the collaborative project’s findings can speak back to that ongoing discussion. He says:

I think what’s valuable is when all the studies talk about “students want grammar and students want vocabulary,” we have not heard why that is. And if we say, “Look, this is happening for us again [in our study],” but then we say, “Here’s a possibility why: it’s because of the context from which they are coming.” It answers a crucial question that still I don’t think has been answered—or at least hasn’t been highlighted enough. It answers teachers when they’re saying, “I don’t know why they want grammar.” Well, we know why.

Here, Joshua acknowledges that the team’s findings resonate with findings from other studies, but he also careful to point out a precise way in which their findings can illuminate those prior studies. In this way, Joshua uses his knowledge of disciplinary literature to contextualize, and add significance to, the initial insight introduced by Chloe and Daisy.

Furthermore, this move to contextualize also helps Joshua re-conceptualize the collaborative study as a whole, as he clarifies what he believes to be the study's most distinctive feature. Joshua points out that what is unique about the study is that the student participants are experiencing an educational transition as they move from classrooms in China to classrooms in the United States. By emphasizing that transition, according to Joshua, the team can make a useful scholarly contribution. He says later in the meeting:

I think one of the things that this study highlights that previous studies haven't highlighted is the interactions with actual tasks for a specific people that are transitioning from the specific context to a new context—something that hasn't been discussed. We're highlighting in our study a transition. These students are in transition and they're having to re-evaluate their goals as they understand what first-year composition [the writing class] is doing for them. That's something that, that negotiation process of understanding goals as you move from one context of language-based learning to writing as writing, is something that hasn't been discussed. I think that that's a significant gap that we can highlight in our literature review.

This focus on an educational transition provided a nuanced lens through which to understand the initial insight developed by Chloe and Daisy. From Joshua's newly formulated perspective, the initial insight began to take on a form potentially recognized as useful by disciplinary readers. As such, this perspective came to be an important frame for the introduction and literature review Joshua drafted for the planned research article.

This extended example—one of many that occurred throughout the project—illustrates the dialogic process through which team members invented insights by examining data and contextualized those insights by drawing on disciplinary and rhetorical knowledge as resources.

Obstacles to Constructing Claims

Moves to contextualize data-driven insights came chiefly from Joshua and Maddox, while other team members participated only minimally. This fact reflected a more general issue—namely, that Daisy, Chloe, and Sophia struggled to construct new knowledge claims, an issue that was consistently evident as the team moved from data analysis to drafting the research report.

Four obstacles emerged as the team attempted to document claims in writing. First, Chloe and Daisy had considerable difficulty articulating generalizations based on the data. While they were able to identify isolated issues that were compelling, they struggled to translate those issues into propositions representative of the data set. On multiple occasions, Daisy explicitly asked how to determine whether a datum was representative of the participant population, even hoping for a “rule of thumb” as a

general guide. During a team meeting, she asked, “We have 24 students interviewed, and then is there like a rule of thumb how many of them have said this point to the point that you can count as representative?” Chloe evinced a similar difficulty, as she often had trouble discerning clear patterns in the data. In a team meeting during the drafting phase, she stated:

I feel like, as I am writing the first part, I can find more instances, while later parts it’s not easy to find “well, OK, most students feel unmotivated.” It’s more like single cases. I can’t really find where *all* the students say something, so I don’t really know how to present the data.

Articulating generalizations by working inductively was a key aspect of constructing claims, but Chloe and Daisy had trouble exercising that degree of judgment.

Second, even when generalizations were in place, Chloe and Daisy also had difficulty threading multiple generalizations together in order to articulate an overarching argument that was presented clearly and supported by data. On multiple occasions, Maddox acknowledged this difficulty when reviewing their writing, saying, “There are lots of interesting stories, it seems, but one thing we don’t want to do is we don’t want to end up presenting just a bunch of anecdotes.” To help them compose a more cohesive argument, Maddox even suggested temporarily setting aside the data:

I think at this point you should start focusing on telling the story, the narrative of what seems to be going on, and then not be driven so much by the data itself. You can even set the data aside, and then start writing, “this is what’s happening,” and tell the story. And then, after you tell the story, you break it into each claim, or each generalization is a paragraph, and then you start plugging in examples to support it.

Daisy suggested possible reasons for this difficulty in an interview. She indicated that she and Chloe “knew” the argument they wanted to write, but that they had trouble translating that knowledge into written discourse: “We actually know what is our argument. [...] I think like we have a list of the things that we want to put on the paper in our own mind, but I think it’s pretty challenging for us to find a proper way to put it in the paper.” In the same interview, Daisy also considered the possibility that her prior educational experience in China may have contributed to her struggles to conform to conventions of Western-style scholarly argument. She noted that she seemed to be following a “Confucius way of writing” in which “you say something at the beginning but not very in depth.” This approach conflicted with what she was learning about the genre she was writing, which asked her to establish claims in ways she was unfamiliar: “But I think what Maddox is saying is that you need to make the argument really clear at the beginning.”

Third, Daisy and Chloe’s rigid assumptions about how to use data in their writing also affected their ability to construct claims. That is to say, in various ways, Daisy and Chloe appeared to be controlled by the data in unhelpful ways. For example, while

drafting, they allowed the arrangement of interview responses to drive their organizational structure, rather than allowing their analysis drive the organization. They believed that the order in which interview participants spoke was the order in which data had to be presented in the written report. Similarly, Chloe seemed to assume that, in reviewing interview transcripts, the students' responses were necessarily tethered to the interview question that was directly asked. As a result, Chloe did not feel she had the authority to divide and move quotations around in the written report in order to support questions other than the one asked during the interview. These rigid assumptions restricted the writers' agency as they worked toward articulating and supporting a written argument.

Fourth, the team's division of labor contributed to some members' difficulty constructing claims. For pragmatic purposes, Daisy and Chloe were responsible for analyzing the Chinese data and drafting the results section based on that analysis; Joshua and Sophia were responsible for gathering scholarly literature for use in the article introduction and literature review. However, this division of tasks kept important disciplinary knowledge out of the hands Chloe and Daisy, who needed to draw on that knowledge to help them generate claims about the data. By the same token, Joshua and Sophia often indicated that, in order to track down the appropriate literature to contextualize the team's findings, they needed to know what the claims were that Daisy and Chloe were discovering. This presented a catch-22 situation in which the progress of both pairs of team members was simultaneously impeded. In an interview, Maddox indicated that poor communication across team members was a likely culprit.

4.3 Forms of Mentorship

Faculty Mentoring

As mentor, Maddox took strategic steps before and during the project to set up learning conditions that invited collaborators' participation in situated disciplinary practices. His initial design of the study, for example, was intentionally aimed at positioning doctoral students to draw on their individual skills, expertise, and emerging research interests as they investigated an authentic disciplinary issue. As he indicated in an interview:

I wanted to assemble a team of students who were speakers of Chinese, or at least have some proficiency in Chinese, and who would be able to share the responsibility of working on this [project]. And I happened to have a few students who fit that bill in terms of their profile and with varying levels of experience and different levels of expertise as well, and I thought it would be a good idea to ask them to work together.

Additionally, throughout the project, Maddox openly described his rationale for many research-related decisions, which allowed students to learn from his behind-the-scenes thinking and set the stage for their own contributions. Referring to his approach, Maddox noted that "every step of the way, what I try to do is do the think-aloud

protocol, voicing my own reservations, questions, and so on, so that the students will not only see my directives and my feedback, but they will also see the reasons for my decisions." Often, Maddox's descriptions of his rationale were punctuated with prompts for the doctoral students to speak back and contribute to issues related to study design, recruitment procedures, and audiences and publication venues for the research report. As he put it, he finds it helpful and encouraging to say, "Here's what I'm thinking; what do you think?" In this way, Maddox created discursive space in which to participate in the co-construction of the project. Along the same lines, Maddox also worked to create spaces for leadership to emerge among the doctoral team. He did this by not delegating tasks directly and by consciously joining team meetings late, which opened up the opportunity for others to facilitate group interaction.

An important form of mentoring came through Maddox's copious situated feedback on the team's ongoing work, particularly their writing at various stages. Maddox provided extensive feedback on research materials early in the project, on coding schemas during analysis, and on multiple drafts of the research report. Team meetings often focused on an individual piece of writing, which Maddox reviewed with the writer line by line. As a reader and stand-in for a disciplinary audience, Maddox carried out a kind of think-aloud protocol, as he described to the writer the way each line of text registered in his mind. Students took notes during these intensive feedback sessions, which were used to revise the text in preparation for the next meeting.

Peer Mentoring

The doctoral team indicated receiving mentoring from peers in various way. One form involved relying on the knowledge of more experienced members. Chloe, Joshua, and Sophia, for example, indicated gaining much technical knowledge about developing research materials from Vivian, whose prior research experience made her a valuable resource. As Sophia put it: "Through this all, I learn a lot from Vivian because she has been through this process." Following Vivian's departure from the project, Joshua gradually assumed a more substantive leadership role, as he coordinated meetings, assigned tasks, and provided helpful feedback on the team's work during meetings. During one meeting, Daisy commented that Joshua looked like a professor in his own right.

A mentoring relationship also formed between Joshua and Sophia. In informal bi-weekly sessions, Joshua led discussions with Sophia about findings discussed in prior team meetings and assigned tasks for Sophia and himself to complete in preparation for future meetings. These tasks included locating and organizing scholarly literature and drafting portions of the research report, such as the introduction, literature review, and methods sections. Sophia also asked Joshua for writing support, requesting feedback on her writing as well as drafts of Joshua's writing so that she could gain a better understanding of writing by studying his approach. Joshua noted in an interview that he

“tried to provide as much explicit feedback about the kinds of things that she’s writing.” In reference to their mentoring relationship, Sophia said, “To me, he’s like a teacher.”

Collaboration also occurred among co-equals, such as the relationship between Daisy and Chloe, who worked through difficult issues together during data analysis, but without a clear mentor and mentee arrangement. A spirit of collaboration also shone through informal interactions, such as joking around with colleagues and sharing experiences when feeling stressed or frustrated. As Chloe noted in an interview, “we are all likely under stress,” so we “make fun of each other,” which is “kind of still helping our communication.” These kinds of interactions often helped to create a sense of comradery and a more relaxed, conducive environment.

Textual Mentoring

Some doctoral students also turned to published texts as a way to gain understanding of the forms and conventions of scholarly argument. During the drafting of the written report, for example, Daisy and Chloe often looked to scholarly articles and chapters, not to gain content knowledge, but to gain knowledge of how to formulate an argument in conjunction with the data they had collected. In an interview, Daisy described resorting to texts for aid: “We’re trying to look at some papers that also have interview data, and then we’re kind of trying to learn from them how we can integrate the data into our paper.” Similarly, Chloe frequently turned to textual sources for writing support as she composed her portion of the article, stating that she did not feel comfortable to solicit feedback from Maddox for every writing-related question that arose.

5. Discussion and Implications

Scholarship on doctoral writing often uses the term “messiness” in reference to complex practices associated with advanced research writing literacies (Bosanquet & Cahir, 2016; Dietz, Kehler, & Yoon, 2016; Wisker, 2016). By examining the linked practices of research and writing in a collaborative setting, the present study contributes additional clarity to the nature of that messiness and to ways it can be leveraged for learning. One source of messiness was the process of negotiating positioning on the research team. Although having been invited to the project for their unique skills and experience, the doctoral students found themselves making decisions about their degree of participation based not only on their unique abilities but on how those abilities stood in relation to others’ and the collective aims of the group. Scholars have argued (Dahlgren & Bjuremark, 2012; French, 2016; Paré, 2011) that, through writing, students gain a nuanced understanding of the disciplinary terrain and learn to position themselves within that landscape. In the microcosm of the collaborative team, the doctoral students took part in a similar type of positioning work, as they learned to situate their own perspectives amidst a number of others.

Engaging in authentic research also provided access to the messiness of grappling with unexpected circumstances in the research environment, which called for an

adaptive flexibility not easily accessed by means other than first-hand experience. Badenhorst and Guerin (2016) contend that the conservative nature of graduate education can shortchange students if they “experience the chaotic world of research as something that needs to be controlled” (p. 14); however, the embedded practices taken up by the doctoral team suggest that such a rigid approach that clings to convention and control is insufficient for developing effective responses to situated and emergent research problems. As activity theorists have argued (Engeström & Sannino, 2010), carrying out collective activities in complex social environments calls for careful attention to and willingness to adapt with the concrete realities on the ground. In a similar way, the research team, by virtue of their engagement with authentic practices, was positioned to design, test, and revise a model for collective action (i.e., the original research design) in the context of their local, lived-in reality—practices not easily encountered by other means.

An outgrowth of this adaptive process was recurring examinations of the team’s research objectives in relation to common disciplinary genres. The ever-shifting ground of the study created opportunities to reflect on prior actions and to set research goals that were conditioned by unique constraints, practices found to be beneficial for strengthening research writing literacies as well as student motivation (Smirnova, 2016). Additionally, in conjunction with reflection and setting research goals, the doctoral students also participated in the critical analysis and production of multiple disciplinary genres. As researchers of genre have argued (Bazerman, 2002; Tardy, 2009), engagement with multiple interrelated genres affords writers a wider understanding of the commonplaces and knowledge-making practices that mark disciplinary activity.

Taking part in that disciplinary activity through written argument requires a high degree of awareness of shared disciplinary knowledge and nuanced rhetorical practices (Kaufer & Geisler, 1989; Tardy, 2005; Turner, 2016). The way in which the team worked toward constructing knowledge claims indeed suggested that claims achieve the quality of newness as they become increasingly tethered to established knowledge circulating throughout a scholarly community. As might be expected, then, it was Maddox and Joshua, the team members most familiar with the scholarly literature, who took on the majority of work associated with creating newness, with situating data-driven insights amidst shared disciplinary knowledge. As research writers, Daisy and Chloe, on the other hand, found themselves struggling to gain traction as they worked with the data, unable to draw on the needed disciplinary resources to give shape to emerging insights in ways that would be useful to potential audiences. The difficulties resulting from a lack of disciplinary knowledge were compounded by the fact that Daisy and Chloe also had rather rigid understandings of the practice of qualitative research and of their roles as researcher writers. That is to say, both Daisy and Chloe entered the project with a limited view of agency afforded researchers and the ways in which they would be called upon to exercise situated judgment. Encountering obstacles during recruitment, analysis, and writing served, in part, to begin loosening the tight grip of those prior assumptions.

Such obstacles also highlighted the importance of procedural knowledge wherein writers finesse ideas into the structure of written discourse. As the doctoral students discovered when they attempted to move from data analysis to drafting, research writing is not simply a matter of “writing up” findings in some neutral, seamless way (Kamler & Thomson, 2006, p. 2). Rather, writing is challenging intellectual work because it demands not only content knowledge but also procedural knowledge involving the active alignment of content with evolving purposes. It is not surprising, then, that the team’s difficulty developing their own written argument coincided with a frequent need to articulate clear research objectives and an orienting sense of purpose. In their study of doctoral writing, Berkenkotter et al. (1988) found that “the growth of declarative [i.e., content] knowledge outstrips that of procedural knowledge” (p. 39). Similarly, the present study suggests that acquiring the content may come more easily than acquiring the practices by which that content is animated through writing.

The mentoring support enacted alongside these research and writing activities were, on the part of Maddox, a conscious attempt to create a kind of productive distress among the doctoral team insofar as they might encounter authentic problems and seek out available tools and resources to resolve them. In keeping with approaches of sociocultural educational theorists (Englert, Mariage, & Dunsmore, 2006), Maddox created “writing contexts that support[ed] new participation structures, roles, rules and collaborations” (p. 217). Team members’ turning to one another and to disciplinary tools, such as research articles, rather than exclusively to Maddox for writing support evidences how “writing apprenticeship can occur despite the absence of a formal mentor” (Maher & Say, 2016, p. 290). Maddox’s approach also served to disrupt the traditional master-apprentice relationship in productive ways. By allowing himself to be put in positions in which he did not necessarily have answers, he authorized students to forge new forms of participation. One such way in which Maddox ceded authority was by inviting students to leverage their knowledge of Chinese in developing research materials, conducting interviews in Chinese, and conducting analysis of data in Chinese. Maddox often deferred to their expertise on issues of translation, which allowed other team members to participate in genuinely authoritative ways.

The findings in this study have implications for doctoral pedagogy. First, the doctoral students’ difficulties constructing claims suggests that students may need considerable more practice in the situated work of using disciplinary resources—such as existing research and rhetorical purposes—to articulate, test, and revise tentative claims about data or other social phenomena. While it may seem obvious that a high degree of content and rhetorical knowledge is needed to construct claims, this study suggests that active engagement in the literature practice of *using* such knowledge to shape, hone, and stabilize claims could benefit doctoral students. Additionally, this study also showed that making claims is intimately tied to research objectives, which are often in flux. It may also be beneficial, then, to design experiences that foreground the dynamic research environment and that ask students to attend to the way purposes are established, how they constrain research and writing practices, and how they often

shift in light of new circumstances and new understandings. Simply providing doctoral students with formal rules or disembodied knowledge may be insufficient for cultivating a deep awareness of the complex interrelations among practices and purposes.

Second, as the work of Lave and Wenger (1991) suggests, learning can be understood as access to, and increased responsibility for, authentic practices. But granting access and increased responsibility calls for potentially uncomfortable task of constructing and occupying problem spaces that do not admit of clear answers or solutions. It is in such spaces that students are likely to encounter and grapple with uncertainty, and thus gain the kinds of disciplinary knowledge not easily acquired by other means. For mentors, this can be a challenge because it requires paying close attention to many variables operating in complex environments and because it precludes the possibility of precise planning. The present study suggests that, when stepping into an authentic research environment with students, mentors must, paradoxically, expect the unexpected and be willing to develop strategic responses in partnership with students. In this study, the mentor was able to develop successful responses to problems because he was cognizant of his mentees' varying levels of development and professional interests and goals. With that knowledge, he was able to shift the scope of the study on various occasions to accommodate the students' needs. To conduct this kind of systemic support work, mentors will likely need a rich familiarity with mentees as well as the freedom to alter the dynamics of collaboration in ways that continue to serve the students' long-term professional goals. Having a shared stake in the project, as the mentor did, may be a way to instill the motivation, among both mentors and mentees, needed to persevere over the long haul.

6. Suggestions for Future Research

The findings from this study suggest possible avenues for further research. First, it may be beneficial to examine the potential effects of gender and cultural background on collaboration in similar contexts. In this study, the most active contributors were male and highly familiar with conventions of Western scholarship, and, while the present study attributed their higher degree of participation to their higher levels of experience, gender and culture may also have influenced collaborative interactions. Moreover, Daisy's comment about different cultural traditions associated with scholarly argument suggests that a contrastive rhetorical approach (Connor, 2003) could provide additional insight. Second, in future studies investigating collaborative construction of disciplinary claims, it may be beneficial to look for additional contextual elements that writers draw on to shape and situate their claims. Identifying additional elements, as well as how they may be related or possibly hierarchized, could offer insight into how claims are invented and how such a process might be taught. Finally, it may be useful for future studies to examine the ways in which relationships are forged between doctoral students and faculty mentors and how collaborative projects such as the one described here can be established and deployed for the benefit of all participants.

Note

[1] A common feature of U.S. colleges and universities is a writing course required of all newly enrolled undergraduates, both L1 and L2 students. The required course, often called first-year composition (FYC), is typically a credit-bearing course in which students are introduced to genres and conventions commonly used in academic discourse. For L2 students, placement in FYC is often based on language proficiency test scores. The Chinese undergraduates who were the focus of the collaborative project had scored high enough to be enrolled in FYC, but were still perceived to struggle with language issues in their writing. Understanding the issues surrounding the students' so-called struggles was the initial focus of the collaborative project taken up by Maddox and the team of doctoral students.

Acknowledgements

I would like to express my deepest gratitude to the participants in this study, who so generously shared their time and thoughtful attention, as well as to the journal reviewers for their insightful and constructive feedback. Thank you.

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Appendix A: Interview guide for student participants: Round 1

1. Prior to this study, what experiences have you had with collaboration?
2. What is the most successful collaboration experience you have had? What is the least successful? What made those experiences successful or unsuccessful?
3. Have you experienced moments of “productive conflict” while collaborating with others? Can you describe them?
4. Could you describe the collaborative project you are involved in?
5. What are your goals in pursuing this research?
6. How would you characterize your level of experience as a researcher?
7. How would you characterize your role as a researcher on this project? What experiences working on the current project have led you to form this view?
8. How would you describe the strengths you bring to this collaborative research project?
9. How does this research relate to your degree progress or major area of focus?
10. What guidance and/or mentoring you have received from the Principle Investigator on this project thus far.
11. How has that guidance contributed to your development as a researcher and scholar?

Appendix B: Interview guide for student participants: Round 2

1. Could you describe your overall experience with the process of this collaborative project?
2. What are some of the memorable moments in this collaborative project?
3. In your view, what makes a collaboration successful/unsuccessful? Has your view changed since starting this project?
4. Has your role as a researcher on this project changed? If so, how?
5. How have you worked to make your strengths visible to the group?
6. Have there been times when you were unable to contribute successfully? Can you describe them?
7. Have you experienced any moments of “productive conflict” in this collaborative project? Can you describe them?
8. What individual goals have you set for yourself in this project? What progress you have made toward achieving your individual goals while conducting this research. Have these goals changed throughout the project? How so?
9. How has this research project impacted your degree progress or major area of focus?
10. Please describe the directions and mentoring you have received from the lead investigator throughout this project.

11. What guidance and/or mentoring have you received from your peers on this project thus far.
12. Please describe the influence the collaborative process has had on your learning and professional growth throughout this research project.

Appendix C: Interview guide for faculty mentor

1. Can you describe your professional title(s) and the responsibilities associated with each?
2. Prior to this study, what experiences have you had with collaboration?
3. What is the most successful collaboration experience you have had and what factors led to that success?
4. What is the least successful collaboration experience you have had and what factors led to the lack of success?
5. Can you describe the collaborative project you are currently involved in?
6. In what ways does this current project relate to your larger research agenda?
7. What, if any, relationship exists between this collaborative project and your institutional position as an administrator?
8. How would you characterize your specific role in this project?
9. What design decisions did you make in the project's early stages or incubation?
10. What other decisions about design have you made during the project itself?
11. What are your general expectations for the graduate student researchers as a group in this project?
12. What specific expectations do you have for each individual graduate student researcher in the project?
13. What role has language played in the project?
14. Can you describe instances in which language or linguistic difference played a significant part in shaping interaction?
15. Can you describe instances in which you have intervened and describe your reasoning for doing so?
16. Can you describe instances in which you have **not** intervened and describe your reasoning for doing so?
17. Can you describe, if possible, instances in which *you* have received guidance and/or mentoring in or because of this project?
18. Can you describe, if possible, instances in which your role as mentor in the project has shifted?
19. How have you developed as a researcher and scholar through participation on this project?