Research Article

Tracing the Impact of Writing Center Tutoring on Graduate Dissertation Writing

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Scopus Abstract

This article reports on a study conducted at a graduate writing center to ascertain how tutors engage with dissertation writers and identify indicators of uptake in doctoral dissertation writing. Doctoral dissertations have been implicated as a barrier to Ph.D. completion, and traditional doctoral supervision is not always directed at writing skill development. Graduate writing centers show promise as a complementary pedagogical resource; however, existing research does not directly address the impact of tutoring on dissertation writing. The present study uses writing analytics to trace connections between tutoring and subsequent draft revisions, drawing on sociocultural learning theories and Swalesian genre frameworks. Four case studies are reported, each encompassing three writing consultations. Findings show that doctoral students' revisions following writing center consultations substantively addressed issues discussed with the tutor and resulted in improvements to writing quality. Specific practices employed by writing tutors are reported; notably, both scaffolding and instructive practices were linked to improvements in subsequent drafts. This study exemplifies the use of writing analytics for qualitative analysis of individual texts, resulting in evidence of the impact of tutoring as a writing intervention for graduate-level writers.

Structured Abstract

- **Literature Review**: This study examines how individual writing tutoring may connect to student uptake in dissertation writing. In response to doctoral program attrition being linked to the challenges inherent in dissertation writing, scholars such as Simpson (2012) have argued that supplemental writing support is needed. Snively et al. (2006) and Summers (2019) propose the model of a graduate writing center. Robust quantitative and qualitative evidence supports the efficacy of individual tutoring for writing skill development, especially at the undergraduate level. Yet the

mechanism by which tutoring could improve dissertation writing quality is unclear. This study aims to use a writing analytics approach to evaluate the potential for writing center tutoring to complement traditional dissertation supervision.

- **Research Questions**: How do Ph.D. students exhibit uptake following tutoring focused on dissertation writing?
    1. Intervention: What kinds of practices are employed with Ph.D. students in peer tutoring/consulting?
    2. Text: (How) do draft revisions affect the frequency of genre competence indicators, in this case, rhetorical moves and quality-detracting traits?
    3. Trace: (How) do draft revisions relate to pedagogical interventions employed in prior consultations?
    4. Recall: What do Ph.D. student writers say about the impact of tutoring on their dissertation writing?
- **Research Methodology**: A case study method was adopted, utilizing a tracing approach (Williams, 2004). Qualitative data from tutoring sessions, dissertation draft revisions, and stimulated recall were analyzed iteratively, in parallel, to trace the development of key genre competence indicators. These indicators were operationalized as textual features associated with writing quality: genre move steps (Swales, 1990) and quality-detracting traits (Terrill, 2019). Doctoral students were paired with writing center tutors for each of four cases. In-progress dissertation drafts were collected before and after three tutoring sessions for each case, and each doctoral student participant took part in a stimulated recall interview following their final tutoring session. Tutoring session recordings and follow-up interviews were analyzed using a codebook of graduate writing center consultant practices (Terrill, 2023). In-progress drafts were coded for genre move steps and quality-detracting traits. The data and analysis were triangulated to elicit evidence linking tutoring to draft revisions.
- **Results**: Findings showed that tutors deployed instructive and scaffolding practices (Thompson & Mackiewicz, 2022). The most frequently observed text-oriented practices were asserting perspective, suggesting, information seeking, and approving/signing off. All four students' draft revisions impacted writing quality with respect to both move steps and quality-detracting traits. Tracing between draft revisions and tutoring sessions suggested that tutoring may have influenced students' writing, and the follow-up stimulated recall reinforced this interpretation. The follow-up interviews also revealed that the most frequently deployed tutoring practices were reflected in those most frequently recalled by doctoral student participants.
- **Discussion**: In all four cases, tutors deployed a range of practices, with the majority oriented toward the doctoral students' texts. Consistent with prior research, tutoring practices combined instructive and scaffolding approaches. Genre move steps and quality-detracting traits were the focus of text analysis. These indicators of genre competence were observed being discussed explicitly in tutoring sessions and were substantively revised in post-tutoring draft versions in all four cases. This

finding, reinforced by students' recall of their revision processes, points to a link between tutoring and improvements in dissertation drafts. The scale of this study precludes attributing a causal relationship between individual tutoring and enhanced genre competence, but the qualitative findings suggest promising directions for future research in a large-scale study.

- **Conclusions**: The results of this study support the use of writing center tutoring to complement doctoral writing support within institutions. As an intervention, tutoring merits further study to ascertain its impact on dissertation writing quality. Writing is one major challenge that has been implicated in delayed and non-completion of doctoral degrees, but availability of writing center tutors with training in research genres could help counteract this problem.
- **Directions for Further Research**: To obtain evidence that the findings of these case studies generalize to a broader population, high-level quantitative studies could be conducted to assess dissertation outcomes for doctoral students who do and do not engage writing center tutoring services. The present study also raises questions about how individual differences among Ph.D. students might affect their experiences with and uptake from tutoring.

1.0 Background

Doctoral dissertation writing has been implicated as a barrier to Ph.D. program completion (Garcia-Castillo, 2019; Locke & Boyle, 2016). Research in higher education and writing studies has examined the challenges involved in dissertation writing from various angles, including the experiences students have while writing doctoral dissertations and how dissertations are evaluated. Studies on dissertation writers' experiences have yielded substantial amounts of subjective data from diverse methodologies, such as case studies (Daigneault et al., 2012; Locke & Boyle, 2016), interviews (Gürel, 2011; Lee & Swales, 2006), and surveys (ul Haq & Shahzad, 2021). In some cases, subjective data are reinforced with textual data and analyses (Komba, 2015; Lee & Swales, 2006). Findings on doctoral students' self-perceived challenges range from time management, financial stress, and relationship issues with their dissertation supervisor (e.g., Garcia-Castillo, 2019; Locke & Boyle, 2016), to challenges stemming from methodological competence (Daigneault et al., 2012) and difficulties with writing and, for some, language (Gürel, 2011; Komba, 2015; Lee & Swales, 2006; Wang & Parr, 2021).

In these ways, dissertation writing may exceed the conventional purview of dissertation supervision, which is perceived as "a particular type of apprenticeship, induction, or socialization" that occurs within "relationships with experienced academics" (Cumming, 2010, p. 26). This conventional perception of doctoral socialization has been problematized for failing to account for variety in supervisor-candidate dynamics and for minimizing the influence of contextual factors (Aitken et al., 2020; Cumming, 2010; Masek & Alias, 2020). In terms of academic writing, Casanave (2019), Simpson (2012), and Welch et al. (2021) have argued that institutional support should complement dissertation supervision by addressing challenges beyond research skills. Graduate writing centers (GWCs), as conceived in Snively et al. (2006), Summers (2019), Welch et al. (2021), and others, answer this call with peer tutoring.

GWCs adapt conventional writing center approaches, such as training student workers to conduct individual tutoring sessions rooted in writing pedagogy (O'Connor et al., 2022; Wittstock et al., 2022), often emphasizing academic English for international graduate students (Simpson, 2012) and discipline-

specific genres and writing practices (Welch et al., 2021). Empirical research on the efficacy of specialized peer tutoring (e.g., Malenke et al., 2024; Williams, 2004) provides backing for GWCs' impact. However, there is an inherent positivist/interpretivist tension at play in drumming up evidence in support of writing tutoring: to establish a generalizable result using a representative sample from a target population would necessitate controlling experimental variables, including pedagogical interventions. This type of research is at odds with the semi-structured, responsive, co-constructed nature of peer tutoring (Paoli & Kenigsberg, 2024). Nevertheless, exploring how GWC tutoring might address dissertation writing challenges has value for developing logic models of complementary support for dissertation writers. Challenges with dissertation writing are presumed to manifest in the text, and such manifestations have been indexed by examiners as factoring into the success or failure of a dissertation (Bourke, 2007). To elucidate whether and how GWC tutoring practices engage with the challenges of doctoral writing in development, the present study used writing analytics to trace dissertation draft revisions across intervals spanning GWC tutoring sessions, focusing on student writers from various disciplines who are writing in an acquired language. This application of writing analytics illustrates the use of digital tools in small-scale investigations of individual texts, thereby expanding the range of textual research to which digital techniques can be applied.

2.0 Literature Review

2.1 Impacts of Writing Center Tutoring on Learning

A robust area of writing center scholarship documents how quantitative methods have been used to generalize an effect of writing center tutoring. Salazar (2021) surveyed 82 quantitative writing center studies in a meta-analysis, finding a statistically significant positive effect of writing center use. At a more granular level, quantitative research on writing centers has examined individual factors that predict writing center use, including students' race and gender (Zuccarelli et al., 2022), students' native language (Eckstein & Matthews, 2024), and consultants' gender (Pedretti & Jewell, 2020). Outcomes have also been examined in quantitative studies, revealing significant correlation between writing center use and higher grades at the assignment level (Zuccarelli et al., 2022), course level (Overbay & Thurley, 2024), and grade point average (Paoli & Kenigsberg, 2024). Featherstone (2021) found higher rates of self-reported transfer among students who had used the writing center. These quantitative studies consolidated the varied events that occur within writing consultations into a single, nonspecific intervention (Paoli & Kenigsberg, 2024). Although they convincingly link positive outcomes to writing center tutoring, high-level quantitative studies obscure how tutoring practices might lead to these outcomes.

On the other hand, qualitative research on writing center pedagogy has provided a rich literature on mechanisms of individualized writing tutoring. Tutoring practices and student experiences, perceptions, and responses have been the focus of extensive research conducted in writing centers (Driscoll & Wynn Perdue, 2012; Ozer & Zhang, 2021). Mackiewicz and Thompson (2015) helped establish a trend of studying writing tutoring practices by developing a succinct list of them. Their coding schema has been repeatedly taken up since its introduction, serving as a common framework to structure research on factors that influence tutoring itself (e.g., Patrick, 2020) and outcomes emerging from tutoring (Bleakney & Peterson Pittock, 2019; Thompson & Mackiewicz, 2022). Tutees have also been engaged to reflect on their learning after writing center visits (Levin et al., 2021; Lundin et al., 2023; Zhang et al., 2020). Research on tutees' impressions of writing tutoring has confirmed that distinct practices within writing tutoring land differentially (Lundin et al., 2023); it has also suggested that students themselves are aware of this differential and use tutoring strategically (Levin et al., 2021; Zhang et al., 2020). Given the

high amount of qualitative research on writing center impacts, there is a conspicuous omission of research that engages directly with student writing, where that impact might be most felt.

2.2 Impacts of Writing Center Tutoring on Writing

Analysis of student-produced writing has not gained a strong foothold in writing center research. With some exceptions (e.g., Bryan Malenke et al., 2023; Lang et al., 2024; Williams, 2004), research on the impact of writing center tutoring focuses more on students' impressions, skill development, and overall performance than on their writing, per se. This may stem from the problem of aggregating and generalizing from highly idiosyncratic phenomena, or it may hearken back to North's (1984) famous slogan for writing centers: "better writers, not better writing," (p. 438). Yet in the same paragraph, North observes that writers visit writing centers motivated to improve the outcome of a "particular text." Institutional decision-makers may, justifiably, care more about student development than about the quality of a particular text, but students should also be considered stakeholders whose investment warrants performance evaluation at the individual project level. Other types of pedagogical writing interventions have been evaluated on the evidence of learner-produced texts, so why not writing center tutoring? Analysis of student writing has been used extensively to evaluate writing courses (Crossley & Kim, 2022; Fourke & Zhou, 2019; McCaffrey et al. 2022; Oddis et al., 2022; Wetzel et al., 2021; Zhang, 2023), workshops (Alinasab et al., 2021), writing groups (Mochizuki, 2022; Mochizuki & Starfield, 2021), and computer-based writing interventions (Dugartsyrenova & Sardegna, 2022; Wetzel et al., 2021). Furthermore, doctoral dissertations have programmatic import comparable to course grades and program completion. Given the individual variability of both writing center tutoring and doctoral dissertations, hypothesizing an explanatory model of how GWCs could fulfill the need for complementary doctoral support necessitates close attention to what happens during and after tutoring, incorporating evidence from both the writing and the writer.

In several studies, researchers have compiled writing- and writer-based evidence to construct a logic model (Mathison, 2005), linking writing pedagogical practices to specific changes students made in their writing. Zhang (2023) used the term tracing to describe the method of (1) observing a writing intervention, then (2) comparing student drafts of a writing project before and after that intervention, then (3) drawing connections between the intervention and the student's textual revisions, and finally (4) verifying those connections in interviews with the student writers. Williams (2004) used such a method to explore the use of writing centers by L2 writers. Bleakney and Peterson Pittock (2019) used tracing to elaborate on Mackiewicz and Thompson's (2015) tutor talk coding schema, finding direct and indirect associations between scaffolding and revision. With respect to graduate writing, tracing has been used to study writing group participation (Mochizuki, 2022; Mochizuki & Starfield, 2021) and feedback from the dissertation supervisor (Zhang, 2023). Tracing has also been used to investigate students' use of computer-mediated feedback with human tutors (Lang et al., 2024) and automated tools (Wetzel et al., 2021). Trace studies may or may not involve evaluating revision quality: Williams (2004) evaluated writing quality holistically, while Bleakney and Peterson Pittock (2019) and Lang et al. (2024) went only as far as linking revisions to tutor talk and feedback. Given its successful implementation in writing pedagogy research, tracing shows promise for evaluating GWC tutoring as a complementary intervention for doctoral dissertation writing.

2.3 Doctoral Dissertation Supervision and Examination

There is no consensus on the set of skills that doctoral supervisors are expected to mentor. Cotterall (2011) noted that supervisors do not always provide explicit writing instruction, and Casanave (2019) posited that supervisors may not have rounded expertise to teach the variety of skills needed to pull off a dissertation. Research on how doctoral dissertations are assessed has revealed that examiners focus primarily on substantive aspects of dissertations, such as grounding in relevant scholarship, methodological rigor, and thoughtful interpretation of research outcomes (Golding et al., 2014; Holbrook et al., 2004). Additionally, examiners consistently pay attention to the writing itself, factoring rhetorical and stylistic evaluations into their final judgment, even if these aspects are not decisive (Bourke, 2007). Writing as a qualified factor of a successful dissertation warrants support for writing skills at the doctoral level and justifies the presence of a GWC, especially when writing pedagogy is outside doctoral supervisors' areas of expertise. To further motivate the specialized development of writing center tutors to support doctoral writing, evidence that such tutoring addresses writing quality in doctoral dissertations is needed.

2.4 Writing Quality and Quality-Detracting Traits

Evaluation of dissertations involves subjective judgments in epistemological, rhetorical, ethical, and semiotic domains, and both valued and devalued qualities weigh on these judgments. The definition of writing quality used here is meant to be interpreted within these bounds. Thus, for this study, writing quality is defined as the degree to which a text's inherent characteristics facilitate or forestall negotiating meaning within its discourse community. This definition draws on Swales' concept of a discourse community (1990), which classifies groups of individuals by their communication genres as well as by cultural features, such as values and norms. Paltridge (2002) and Paltridge and Starfield (2020) have noted that formal variations in graduate theses and dissertations across disciplines warrant conceiving them as discrete genres.

Existing scholarship on writing quality emphasizes text features that correlate positively (e.g., McNamara et al., 2010), but there is a need for a schema to describe characteristics that forestall negotiating meaning within a discourse community. Blau et al. (2002) established a convention of classifying writing tutors' critiques as local (i.e., focused on grammar, syntax, vocabulary usage, idiomatic expression, and mechanics) and global (i.e., concerned with focus, organization, and the development of ideas). Building on the local-global classification, a coding schema for text that detracts from writing quality was developed (Terrill, 2019). This schema lists categories of quality-detracting traits (QDTs)—aspects of text that forestall the negotiation of meaning—within the broader categories of global and local concerns, in accordance with Blau et al. (2002). The categories are listed in Table 1.

Table 1

Textual Categories in Two Conceptual Levels

Global	Local
Composition	Mechanics
Genre conformity	Formatting
	Language use

Within the global concerns category, two major classifications are identified: composition and genre conformity. QDTs of composition refer to text features that would detract from writing quality in most or all formal genres of writing, not just research. QDTs in this classification concern not only those problems identified by Blau et al. (2002)—focus, organization, and idea development—but also cohesion, clarity, and argumentation. Cohesion refers to features in the text that connect ideas across sentences (Crossley et al., 2016). Aspects of cohesion adapted in the QDT schema include problems related to pronouns and antecedents, and linking adverbials.

Another widely referenced marker of writing quality, clarity, is an element of global writing quality valued by thesis examiners (Bourke, 2007; Golding et al., 2014) and more generally in academic writing. However, the concept of clarity has been criticized as being under-defined, subjective, and laden with ideological baggage (Barnard, 2010, 2014). Only a few researchers (Hartley et al., 2004; Ruscetti et al., 2018) have devised situated schemata for representing clarity. Ruscetti et al.'s (2018) schema details elements that enhance clarity in quantitative comparison sentences but does not address clarity at the global level. Hartley et al. (2004) used sentence length (words per sentence) and Flesch Reading Ease score (Flesch, 1948) as measures of clarity but did not define clarity explicitly or draw connections between this construct and the chosen measures; they also did not engage with critiques of the Flesch Reading Ease score as a measure of readability (see, e.g., DuBay, 2004, for a summary of critiques). To attempt to deal with the lack of clarity surrounding "clarity," the QDT coding schema specified that lack of explicitness and faulty assumptions of readers' background knowledge detract from clarity.

Whereas cohesion and clarity relate to the interpretability of a text, they do not address persuasiveness. This is the domain of argumentation, which functions in dissertations to establish, for instance, the validity of methods and the originality and significance of the findings. Scholarship on argumentation has focused on distinguishing aspects of argumentative texts—such as prosodies (Hood, 2006), modals, and declaratives (Coffin, 2004)—and argumentation schemes (Song et al., 2014). In the QDT schema, problematic argumentation is operationalized as faulty logic, inappropriate hedging or boosting (Hyland, 1998), and knowledge telling instead of knowledge transforming (Bereiter & Scardamalia, 1987).

Negotiation of meaning is facilitated by genre prototypicality. Swales (1981, 1990) introduced the concepts of moves and steps as rhetorical units indicative of genre prototypicality. Frameworks for analyzing moves and steps in different sections of dissertations have been established in genre analysis research (e.g., Cotos et al., 2017; Ghane, 2021; Kwan, 2006). Komba et al. (2015) and Dressen-Hammouda (2008) have described ways in which novice writers' unsuccessful attempts to perform disciplinary genres forestall their texts from realizing generic purposes. To account for the detractive impact of this performance on writing quality, the QDT schema includes a global classification that addresses missing moves/steps, unsuccessful attempts to realize a move/step, and moves/steps from other part genres.

What Blau et al. (2002) call "local concerns" are a topic of debate in writing center scholarship. Whereas conventional wisdom (see Cirillo-McCarthy et al., 2016) holds that writing center tutoring is more effective when it focuses on global concerns, Babcock and Thonus (2018), Blau et al. (2002), and Mackiewicz and Thompson (2024) have argued that local concerns are as salient and teachable as global concerns. Furthermore, presentation errors were specifically identified as areas of concern to thesis examiners in Golding et al. (2014). To identify and classify QDTs of this nature, the QDT schema contains three classifications of local concerns: mechanics, formatting, and language use.

The QDT schema represents a novel and needed contribution to scholarship investigating writing quality. By focusing on global and local aspects of writing quality, the QDT schema enables analysts to

identify multiple, overlapping problems. As such, it complements existing move frameworks for analyzing the quality of dissertation drafts.

3.0 Research Questions

To summarize, this study used a writing analytics approach to evaluate writing center tutoring as institutional dissertation writing support. Given that writing quality influences dissertation assessment and that dissertation supervisors may provide less writing-specific instruction, this study examined whether and how writing center tutoring can be linked to doctoral writers revising in ways related to domain-specific writing quality as an indicator of the writers' genre competence. This study used a tracing design to address the following research question: How do Ph.D. students exhibit uptake following tutoring focused on dissertation writing? This question was pursued in four parts.

Drawing on the literature on GWC tutoring practices (e.g., Bleakney & Peterson Pittock, 2019; Mackiewicz & Thompson, 2015), the present study undertook direct observation of individual tutoring sessions to enable the identification of specific practices that could connect to textual revisions:

1. Intervention: What kinds of practices are employed with Ph.D. students in peer tutoring/consulting?

To examine whether and how textual revisions observed following tutoring sessions could support inferences about changes in writers' abilities linked to GWC tutoring, the study also included textual analysis, focused on writing quality as an indicator of dissertation genre competence:

2. Text: (How) do draft revisions affect the frequency of genre competence indicators, in this case, rhetorical moves and quality-detracting traits?

To ascertain whether textual revisions could be linked to discrete GWC tutoring practices, the third part of the research question explicitly inquired about tutoring practices and text in tandem:

3. Trace: (How) do draft revisions relate to pedagogical interventions employed in prior consultations?

Finally, to triangulate the data and address unobserved contextual factors that might corroborate, contest, or complicate the findings from the analysis of tutoring sessions and text revisions, the study considered how writers recalled their experiences with the tutors and their revision of their dissertation drafts after tutoring sessions:

4. Recall: What do Ph.D. student writers say about the impact of tutoring on their dissertation writing?

4.0 Methodology

4.1 Research Design

This article describes four case studies that aim to trace the impact of tutoring at a GWC using qualitative data: observations of GWC consultations at multiple time points, writing samples provided by participants, and participant interviews. The four cases represent various combinations of factors that have been shown to affect writing center tutoring, such as student and tutor gender (Pedretti & Jewell, 2020; Zuccarelli et al., 2022), language background (Eckstein & Matthews, 2024), and academic discipline (Welch et al., 2022). Given the limited availability of participants, it was not

feasible to include more than four cases in the study. The number of cases supports the stated purpose of the study, which is to test an application of writing analytics in evaluating GWC writing support. Integrating digital and analog data collection and processing enabled tracing participants' uptake from GWC consultations. In a clarifying essay, Palermo (2017) laid out a schema articulating "permutations, or valences" (p. 311) in which digital technologies are deployed in writing studies and problematized the apparent opposition between traditional writing studies and computational writing analytics. In contrast to the "distant reading" paradigm (Moretti, 2013), the use of digital analytic techniques in the present study serves to contract the aperture of observation and incorporate a chronological dimension. Here, digital technologies have been used to elucidate dissertation writers' revision process by closely examining their revisions in the context of tutor talk and stimulated recall. This is a close reading enabled by digital technologies. In Palermo's (2017) four-valence schema, the technique described here can be classified as "analytics of writing" (i.e., the use of computational tools to collect and analyze written texts as data). The tracing design (Williams, 2004; Zhang, 2023) adopted in this study enables contextualizing the writing-product within the writing-process. Thus, the "analytics of writing" classification invokes both senses of "writing": product and process.

The research design is depicted in Figure 1. Genre competence indicators are features that can be observed in the text, supporting inferences about the writer's ability. In this study, rhetorical moves and steps and QDTs were analyzed as genre competence indicators. The first layer of observation is the intervention to establish whether and how genre competence indicators are addressed. The next layer of observation is the text. This observation should be diachronic and include draft versions prior to the intervention and after. Text analysis is in terms of the genre competence indicators. The third layer of observation is the trace: the analyst examines revisions made to the text alongside the observed intervention to identify likely connections, again, focusing on genre competence indicators. Finally, the writer is presented with selected revisions and excerpts from the intervention record as stimuli in an interview. The writer is asked to recall their writing process and comment on the influence of the intervention.

Figure 1

Proposed Design Model for Tracing Development of Genre Competence Through Pedagogical Intervention and Subsequent Revision

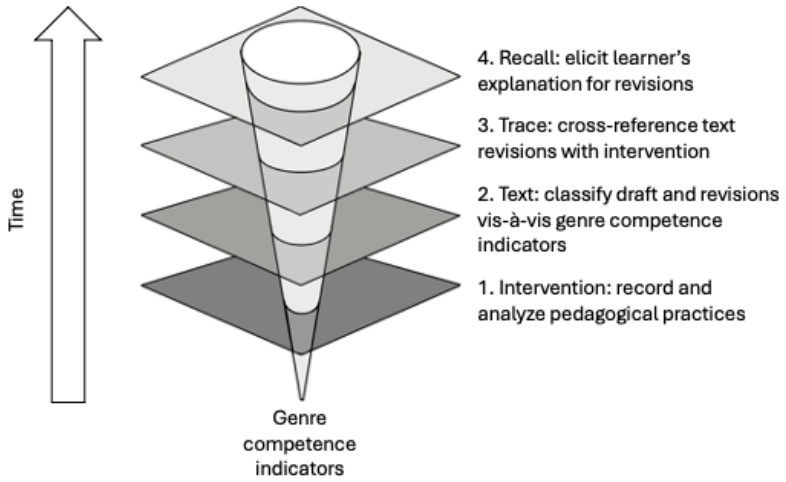
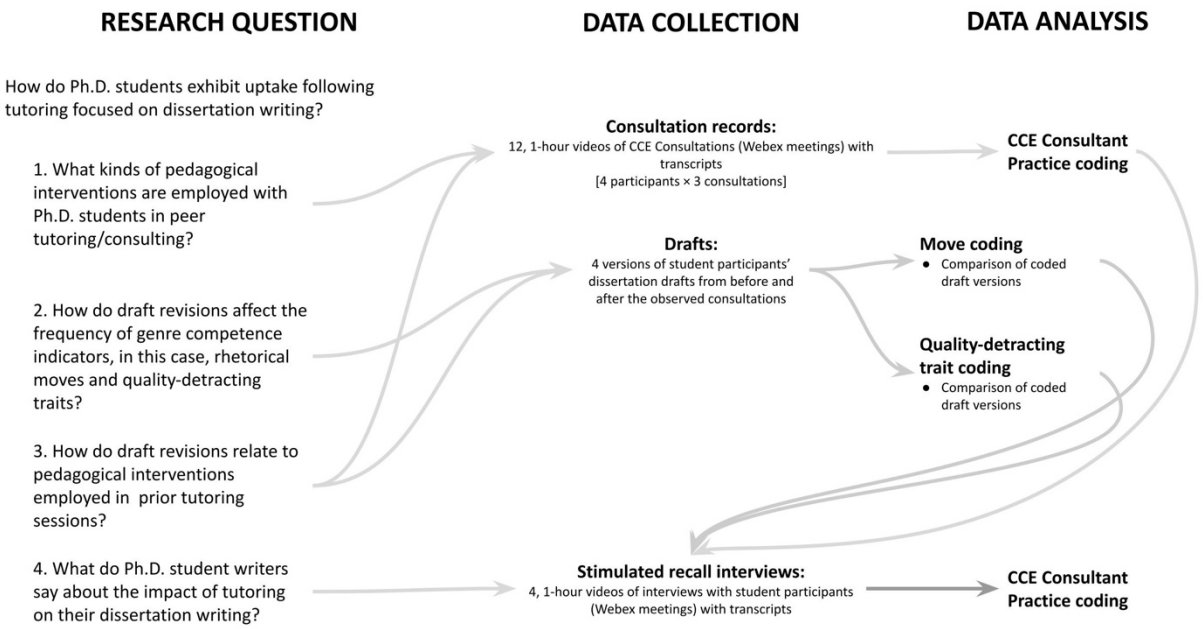


Figure 2 details how the tracing design was applied in the current study. Each component of the research question corresponds to one layer of the tracing design. Four cases were observed, characterized by a pairing of one doctoral student writer and one GWC consultant. These observations took place in the Center for Communication Excellence (CCE), a GWC at a large, Midwestern US university. Each case involved direct observation and video recording of three consultations as interventions. Before each observed consultation, the student was requested to provide their current dissertation draft; a draft was also collected from each student following their third consultation. After the consultation recordings and drafts had been analyzed, a 60-minute stimulated recall activity was conducted.

Figure 2

Study Design Details



4.2 Sampling Plan

To recruit participants for this study, GWC tutors who had agreed to participate in a prior study were asked to provide names of eligible doctoral student participants. The prior study involved ethnographic observation of GWC consultants to describe their practices. Participants in the prior study did not receive training or feedback on their practices; it is assumed that the tutors' prior participation did not meaningfully influence their behavior in the present study. Inclusion criteria for student participants specified international doctoral students working on dissertations. International students were selected to focus on how tutoring addresses distinct challenges that second language (L2) writers confront in research writing (Gürel, 2011; Pearson, 2020; ul Haq & Shahzad, 2021). Student participants were recruited via referrals by GWC consultants, so each one

had prior experience with GWC tutoring. Student participants were incentivized to participate by receiving a $10 gift card for each observed consultation they attended during the study period. Four doctoral students agreed to participate in this study. The study plan was approved and monitored by the Institutional Review Board at Iowa State University.

4.3 Participants

The participants were three consultants and four Ph.D. student tutees. The Ph.D. student tutees were recruited as participants in a larger-scale study that focused on academic language socialization for non-native speakers. Although nationality and language background are not focal variables for the present study, these demographic details are reported to contextualize the findings of the study. Consultant-student pairs were matched based on schedule availability. Demographic information about each pair is provided in Tables 2–5. For confidentiality, student participants are identified with pseudonyms and consultants are identified by letter designations.

Table 2

Case 1 Participant Pair Information

	Selem	**Consultant A**
Student designation	Ph.D. candidate	Ph.D. student
Gender	Male	Female
Discipline	Applied Linguistics and Technology	Applied Linguistics and Technology
Native language	Turkish	Turkish
Stage in Dissertation Process	Writing dissertation	N/A
Consulting specialization(s)	N/A	English writing
Semesters as a consultant as of February 14, 2022	N/A	1

Table 3

Case 2 Participant Pair Information

	Dafina	**Consultant B**
Student designation	Ph.D. student	Ph.D. student
Gender	Female	Male
Discipline	Applied Linguistics and Technology	Applied Linguistics and Technology
Native language	Macedonian	English
Stage in dissertation process	Proposing dissertation	N/A
Consulting specialization(s)	N/A	English writing, interdisciplinary writing, thesis and dissertation
Semesters as a consultant as of February 14, 2022	N/A	4

Table 4

Case 3 Participant Pair Information

	Kaavia	**Consultant C**
Student designation	Ph.D. student	Ph.D. student
Gender	Female	Male
Discipline	Chemistry	Mechanical Engineering
Native language	Tamil	English
Stage in dissertation process	Writing dissertation	N/A
Consulting specialization(s)	N/A	Interdisciplinary writing
Semesters as a consultant as of February 14, 2022	N/A	1

Table 5

Case 4 Participant Pair Information

	Fajar	**Consultant A**
Student designation	Ph.D. student	Ph.D. student
Gender	Female	Female
Discipline	Applied Linguistics and Technology	Applied Linguistics and Technology
Native language	Indonesian	Turkish
Stage in dissertation process	Proposing dissertation	N/A
Consulting specialization(s)	N/A	English writing
Semesters as a consultant as of February 14, 2022	N/A	1

No attrition occurred over the course of the study.

4.4 Instruments

4.4.1 Consultant Practice Coding Schema

A prior ethnographic study conducted at the CCE (Terrill, 2023) found that consultants drew on a large and versatile repertoire of strategies for providing instruction when tutoring graduate student writers. The list of strategies from that study served as an instrument for analyzing the consultation records collected for these case studies.

4.4.2 Genre Analysis Frameworks

Text analysis involved identifying features that facilitate and forestall the negotiation of meaning, consistent with the definition of writing quality that informed this study. As a measure of facilitative (i.e., positive) writing quality, draft versions were analyzed using relevant genre analysis frameworks (Cotos et al., 2015; Ghane et al., 2021; Kwan, 2006) that followed Swales's (1990)

"creating a research space" (CARS) model of identifying rhetorical moves and component steps. Table 6 lists the established move frameworks (Cotos et al., 2015; Ghane et al., 2021; Kwan, 2006) used to analyze each student participant's dissertation drafts.

Table 6

Coding Schemata for Coding Each Participant's Drafts

Participant	Genre	Coding Framework
Selem	Traditional (IMRD) dissertation	Cotos et al. (2015); Kwan (2006)*
Dafina	Dissertation proposal and literature review	Ghane et al. (2021); Kwan (2006)*
Kaavia	IMRD research article (journal article dissertation chapter)	Cotos et al. (2015)
Fajar	Literature review	Kwan (2006)*

** Kwan's (2006) literature review schema was adapted by adding Step 5: Outlining the structure of the paper within Move 3, "Occupying the research niche by announcing." This step was appropriated from Introduction: Move 3/Step 9 in Cotos et al., 2015 and Swales, 1981.*

4.4.3 Quality-Detracting Trait (QDT) Coding

A QDT schema (Terrill, 2019) was used to identify features forestalling writing quality. A summary is provided below.

Mechanical QDTs: deviations from standard conventions of written language, such as spelling, punctuation, capitalization, and typography.

Formatting QDTs: deviations from standard conventions of format. In the cases studied, formatting QDTs were observed in in-text citations.

QDTs of Language Use: problems with the language itself at the local level (within a sentence). These traits include errors as well as text that is confusing, ambiguous, difficult, or distracting[1] (Golding et al., 2014):

- Inaccurate, inappropriate, or unconventional language choices
- Ambiguous phrasing
- Convoluted or unnecessarily complex phrasing or syntax
- Lexical redundancy

QDTs of Composition: problems that could be considered generally detractive from quality in most or all formal genres of English writing. The following list provides examples of features that detract from quality at the composition level:

- Paragraphing: missing topic sentences, unclear topic, missing topic content, off-topic content, missing or inappropriate transition

1 The QDT coding schema intentionally includes subjective judgments, as CCE consultants use their subjective judgment when providing feedback to students. Additionally, readers' subjective experiences can impact the success or failure of academic writing tasks (see McKinley & Rose, 2018).

- Argumentation: faulty logic; inappropriate hedging or boosting (Hyland, 1996, 1998); telling information, as opposed to transforming knowledge (Bereiter & Scardamalia, 1987); inconsistent authorial voice
- Faulty assumption of readers' background knowledge: undefined terminology, topic discussed but not introduced
- Lack of explicitness, lack of cohesion
- Redundancy of content or ideas

QDTs of Genre Conformity: problems with rhetorical conventions when developing an argument in the genre of research writing. Drawing on frameworks developed by English for Academic Purposes (EAP) scholars (Cotos et al., 2015; Ghane et al., 2021; Kwan, 2006; Swales, 1981, 1990), QDTs in this category refer to instances where either a rhetorical move or step is missing entirely, attempted but not fully realized, or included where it is not characteristic.

- Move development: missing move, unsuccessful attempt to realize a move, move from a different part genre
- Step development: missing step, unsuccessful attempt to realize a step, step from a different part genre

4.4.4 Recall Interviews

After the consultations and the draft files were analyzed, stimulated recall materials were developed for each case. Stimulated recall is a data collection method in which participants respond to questions about prior experiences while engaging with a stimulus to aid their recall (DiPardo, 1994). Items in the interviews included an explanation of the interview protocol, general questions about students' experiences in the individual writing consultations, two sets of questions paired with artifacts intended to stimulate the interviewees' recall, and wrap-up questions. The artifacts used as recall stimuli included excerpts of draft versions collected before and after a consultation, and a video excerpt from a consultation. Excerpts from the relevant comparison files, visualizing the changes between the two versions, were available to participants by request. A sample question set is provided in the Appendix.

4.5 Procedures

4.5.1 Consultations

Participation in the case study involved attending three consultations (see Table 7). Student participants were requested to discuss their dissertations during these observed consultations.

Table 7

Writing Consultation Observations

Ph.D. Student Participant	Consultant	Consultations	Observation Date
Selem	A	First	February 14, 2022
	A	Second	February 21, 2022
	A	Third	February 28, 2022
Dafina	B	First	March 10, 2022
	B	Second	March 24, 2022
	B	Third	March 31, 2022
Kaavia	C	First	March 15, 2022
	C	Second	March 23, 2022
	C	Third	April 4, 2022
Fajar	A	First	March 3, 2022
	A	Second	March 23, 2022
	A	Third	April 7, 2022

Each observed consultation took place in Webex (Cisco, 2020) and was recorded using the embedded meeting recorder. Video files contained images from meeting attendees' web cameras and screen shares, if enabled, and audio from attendees' microphones, if enabled. The meeting recorder also generated a .txt file containing an automatically generated transcript.

4.5.2 In-progress Drafts

Each student participant was asked to provide four versions of their dissertation drafts. Individual differences among participants accounted for the variety of genres and part genres in the drafts collected. Draft versions were collected prior to each observed consultation, and one additional version was collected after each participant's final observation. The Compare function in Word (Microsoft, 2023) was used to visualize changes between versions spanning each consultation. Three sets of change-visualized files were created for each case, comparing the second to first, third to second, and fourth to third versions of each dissertation.

4.5.3 Stimulated Recall Interviews

Interview materials were developed for each student using content from their consultation recordings and their dissertation drafts as recall stimuli. The interviews took place on Webex (Cisco, 2020). The embedded recorder generated a video file and a .txt file containing an automatically generated transcript. Student participants were provided with excerpts from three files: 1) an excerpt from a version of their dissertation draft collected before a consultation, 2) a Webex video excerpt from that consultation, and 3) an excerpt from a version of their dissertation draft collected after the consultation. They were asked to recall what, if any, impact the consultation had on their writing of the subsequent draft version.

For the consultation video excerpts, the prompt was to watch the full excerpt one time uninterrupted, and then to watch it a second time, using the "pause" control at their discretion and to talk about memories associated with that part of the consultation. After the second watch-through, they were questioned about their memories of the excerpt overall. After prompting the participants to peruse the "after" draft version excerpts, participants could ask to see visual comparisons. Participants were asked to comment on whether and how the consultation connected to their draft revisions.

4.6 Data Analysis

4.6.1 Intervention: Consultation Videos

Transcripts of each recorded consultation were analyzed using NVivo (Lumivero, 2023) with the consultant practices coding schema. Each consultant utterance received one or more codes. The unit of analysis was the practice being enacted. To assess coding reliability, a CCE staff member was engaged as a second coder for one randomly selected consultation, which contained 121 consultant utterances. For 72% of these utterances, the two coders agreed on one or more consultant practices. Practice frequencies were aggregated across the three consultations and normalized as percentages.

Additionally, transcripts were annotated to indicate students' composition actions, including *reading aloud*, *highlighting/adding emphasis*, *commenting*, and *revising*. These annotations and analytic memos facilitated tracing connections between consultations and draft revisions.

4.6.2 Text: Draft Coding and Comparison

Drafts were analyzed with NVivo (Lumivero, 2023). To code moves and steps, each sentence was assigned a primary code containing a step and the associated move. Secondary steps were assigned to sentences that employed more than one strategy or achieved more than one rhetorical goal, as in Cotos et al. (2017). Two second coders, who were both experienced genre analysts, coded a random sample of 10% of the sentences from one Ph.D. student participant's initial draft. Percent agreement and Cohen's kappa (1960) were calculated as measures of intercoder reliability for primary move and primary step codes. Cohen's kappa is reported here (Table 8) as a statistical measure of agreement; however, Rau and Shih (2021) explain why percent agreement is considered a more appropriate measure for genre move analysis. Agreement was fair to moderate at the step level, and substantial at the move level.

Table 8

Percent Agreement and Cohen's kappa for Primary Move and Step Intercoder Reliability

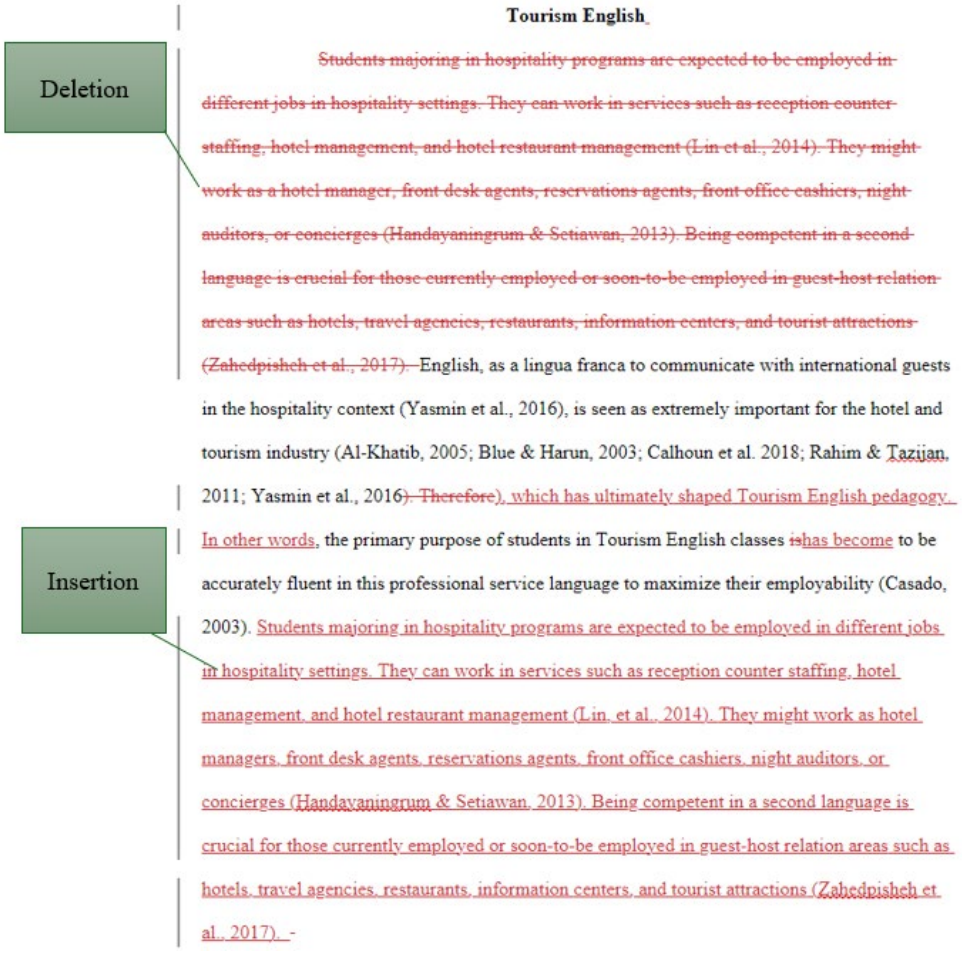
	Primary Move		**Primary Step**	
	Percent agreement	**Kappa**	**Percent agreement**	**Kappa**
Secondary Coder 1	92	0.63	65	0.35
Secondary Coder 2	88	0.85	58	0.46

Analysis of QDTs was done after move coding. QDT analysis entailed reading through the draft from the perspective of a writing tutor[2] alert to features of the text that would warrant feedback. A second coder applied the QDT categories to a random sample of 10% of sentences in each participant's draft. Thirty-six sentences were analyzed. The first coder identified 18 QDTs in 18 sentences (50%); the second coder identified 43 QDTs in 30 sentences (83%). In 16 sentences (44%), both coders agreed on whether the sentence contained (14 sentences) or did not contain (2 sentences) any QDTs. In 57% of sentences where both coders agreed that there was a QDT, they agreed on what kind of QDT it was.

For each set of draft versions (first through fourth versions), the frequency of each move/step and QDT was recorded in a spreadsheet. Revised drafts (i.e., draft versions collected after the first recorded consultation) were compared to preceding draft versions using Word's (Microsoft, 2023) Compare function (see Figure 3), which graphically depicts changes as additions and deletions. For each revised version, additive, subtractive, and net frequencies for each step and QDT were recorded.

Figure 3

Cross-version Comparison Page with Insertions and Deletions (Case 1, Draft Versions 2 and 3, May 13, 2022)



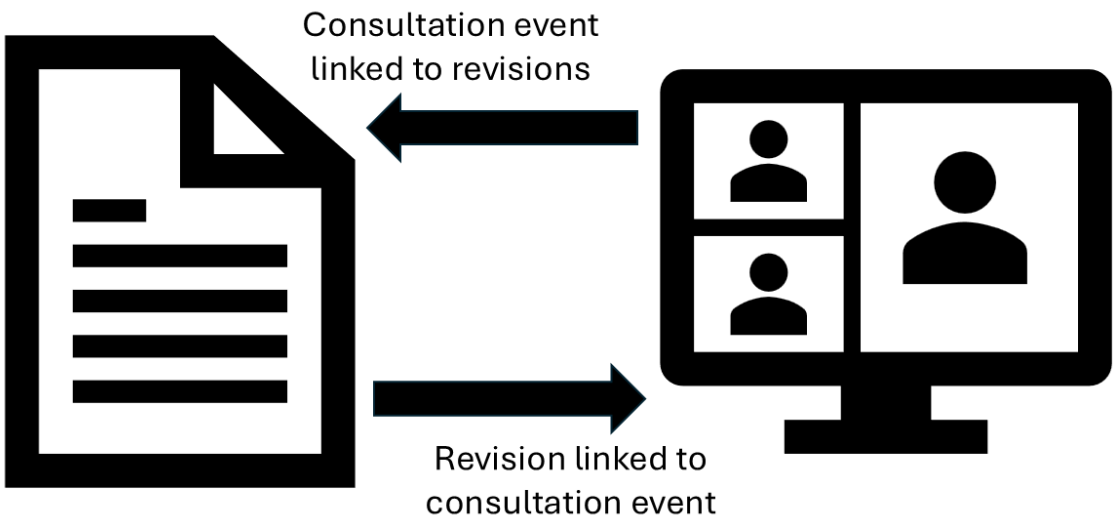
[2] The analyst had been certified, and was engaged, as a CCE consultant during the time this study was conducted.

4.6.3 Trace: Consultation-revision Cross Coding

Following discrete analyses of each data type, writing consultations were cross coded with dissertation draft revisions. Cross coding was conducted bidirectionally. Tracing connections from consultation to draft revision involved identifying points in the consultation where a specific section of text or writing issue was discussed, then examining the subsequent draft versions to identify related revisions. Tracing connections from draft revision to consultation involved identifying revisions in the text, then examining records of preceding consultations to identify related discussion. This analysis is depicted in Figure 4. Connections between consultations and draft revisions were noted and used to develop stimulated recall interview instruments.

Figure 4

Bidirectional Consultation-draft Cross-coding



4.6.4 Recall: Interview Analysis

Stimulated recall interviews were recorded and transcribed. Interview transcripts were coded using the consultant practice coding schema. Student mentions of consultant practices were counted.

5.0 Results

5.1 Intervention

For each case, three writing consultations were observed, recorded, transcribed, and coded. Across the four cases, thirty-three practices were observed being enacted by the consultants. They are listed below in descending order by frequency; Figure 5 depicts the frequency of each practice within each case. The codebook differentiates practices that engaged directly with the student's

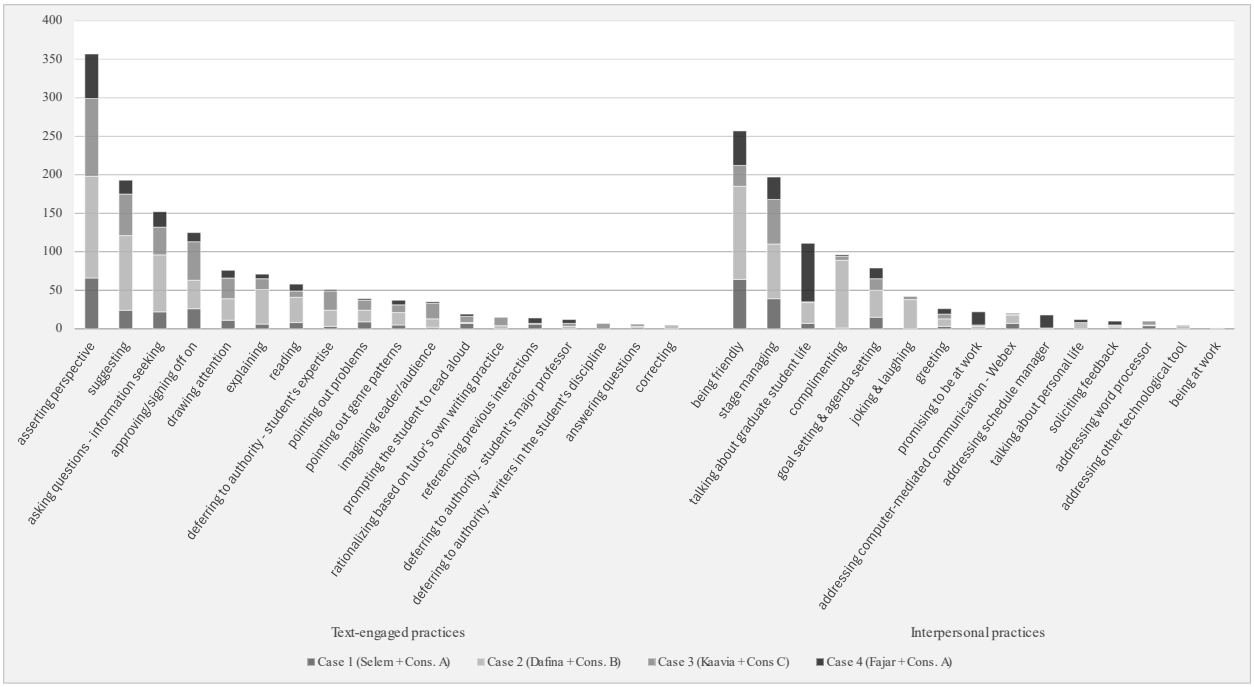
text from procedural and rapport-building practices. Text-engaged practices are emphasized with bold format and asterisks throughout the rest of this article.

1. **Asserting perspective***
2. Being friendly
3. Stage managing
4. **Suggesting***
5. **Asking questions – information seeking***
6. **Approving/signing off on***
7. Talking about graduate student life
8. Complimenting
9. Goal setting & agenda setting
10. **Drawing attention***
11. **Explaining***
12. **Reading***
13. **Deferring to authority – student's expertise***
14. Joking & laughing
15. **Pointing out problems***
16. **Pointing out genre patterns***
17. **Imagining reader/audience***
18. Greeting
19. Promising to be at work
20. Addressing computer-mediated communication – Webex
21. **Prompting the student to read aloud***
22. Addressing schedule manager
23. Rationalizing based on tutor's own writing practice
24. **Referencing previous interactions***
25. Talking about personal life
26. **Deferring to authority – student's major professor***
27. Soliciting feedback
28. Addressing word processor
29. **Deferring to authority – writers in the student's discipline***
30. **Answering questions***
31. Correcting*

32. Addressing other technological tool
33. Being at work

Figure 3

Practices Observed in Consultations

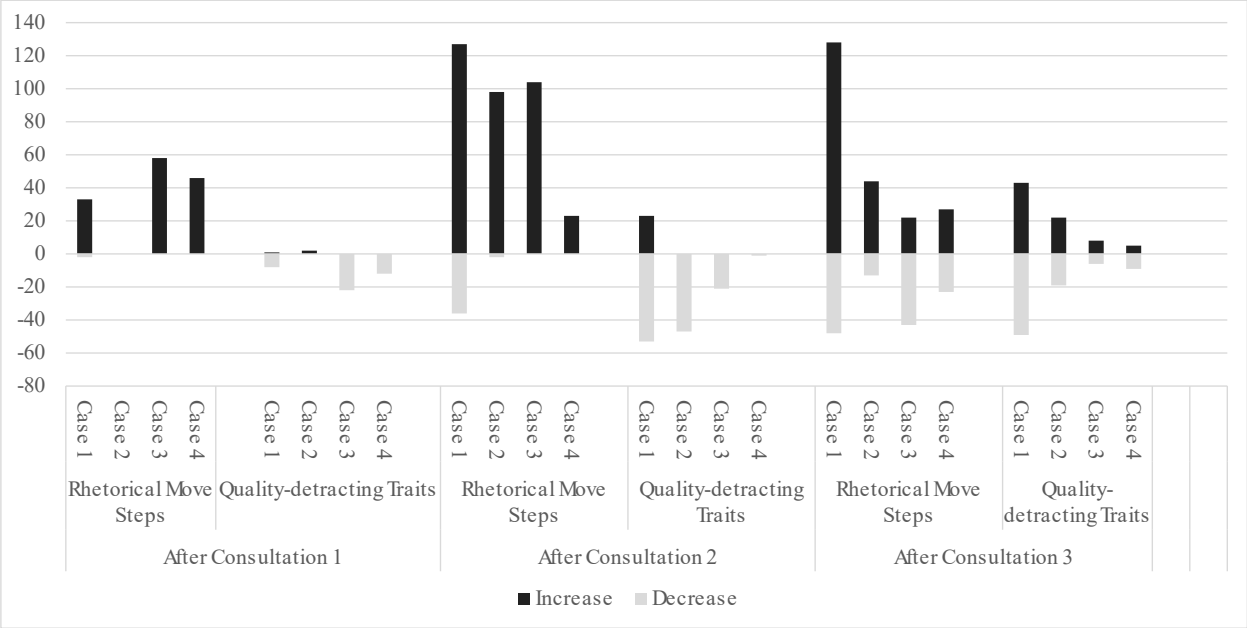


5.2 Text

Student participants' in-progress dissertation drafts were collected at four points spanning each individual consultation. Drafts were then digitally compared to identify revisions. Each draft version was coded twice: first to quantify rhetorical move steps and second to quantify QDTs. These features are indicative of genre competence in dissertation writing. Figure 6 depicts the change in frequency of both indicators for all four cases. Increase values reflect all revisions that added the respective feature; decrease values reflect all revisions that subtracted the respective feature. The net frequency of each feature in the respective draft is equal to the increase minus the decrease. Rhetorical moves are positive indicators of writing quality, so increases in rhetorical move steps can, broadly, be interpreted as improved quality; QDTs, on the other hand, are negative indicators of writing quality, so decreases in QDTs are interpreted as improved writing quality.

Figure 4

Changes in Quality Following Each Consultation, Measured in Rhetorical Moves and Quality-detracting Traits



5.3 Trace

Two or more instances of hypothesized connections between the consultation and subsequent revisions in the dissertation draft were identified for each case. The identified connections had the following characteristics:

- Consultation content related to indicators of genre competence
- Revisions addressed the issue raised in consultation
- Revisions related to indicators of genre competence

Table 9 summarizes the findings of the trace analysis. Connections identified in this analysis constituted the content of the stimulated recall instruments.

Table 9

Summary of Consultation-revision Connections Identified for Stimulated Recall Interview Instruments

Case	Consultation-revision Connection	Consultant Practice	Change in Rhetorical Move Step	Change in QDT
1	a	Asserting perspective Suggesting	N/A	- 2 QDTs
1	b	Asserting perspective Pointing out problems	+ 15 move steps - 3 move steps	- 4 QDTs

Case	Consultation-revision Connection	Consultant Practice	Change in Rhetorical Move Step	Change in QDT
		Suggesting Drawing attention Reading		
2	a	Suggesting	N/A	- 2 QDTs
2	b	Suggesting Pointing out genre patterns Asking questions – information seeking Asserting perspective	N/A	- 4 QDTs
3	a	Asserting perspective Drawing attention Deferring to authority – writers in the student's discipline	+ 3 move steps	- 3 QDTs
3	b	Asking questions – information seeking Asserting perspective Imagining reader/audience Suggesting	+ 12 move steps - 12 move steps	- 4 QDTs
4	a	Asking questions – information seeking Asserting perspective Deferring to authority – student's major professor Pointing out genre patterns Drawing attention Reading Suggesting	- 4 move steps + 1 move step	- 3 QDTs
4	b	Asserting perspective Suggesting Asking questions – information seeking Pointing out problems Talking about graduate student life	+ 10 move steps - 2 move steps	-1 QDT

5.4 Recall

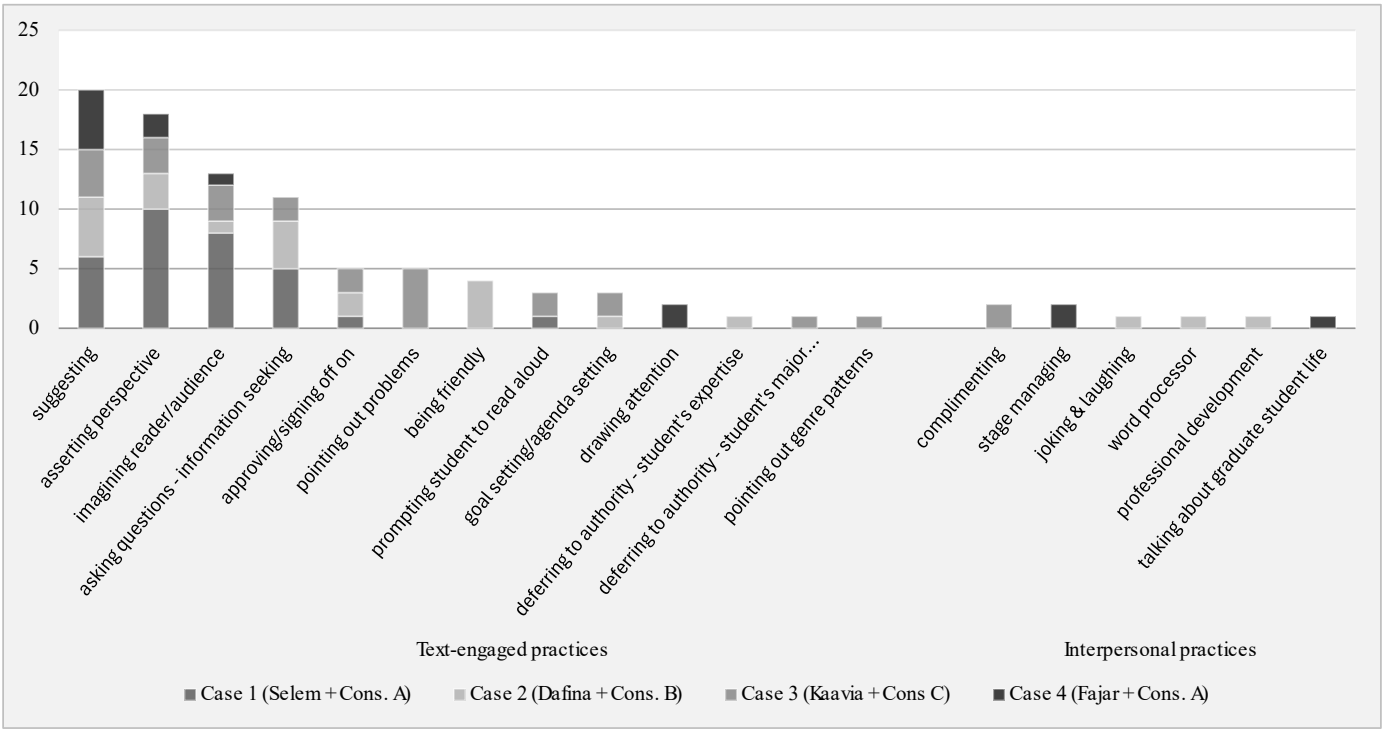
The last stage of the tracing design involved engaging student participants in a stimulated recall activity. In addition to informing interpretation of traced connections between consultations and draft revisions, transcripts of these interviews were coded to ascertain which consulting practices students recalled and linked to their dissertation draft revisions. Below are the consultant practices

recalled by the Ph.D. student participants, in descending order of the frequency with which they were mentioned in the interviews. Most of the practices recalled by students were text-engaged practices. Figure 7 presents the frequency with which each practice was recalled.

1. **Suggesting***
2. **Asserting perspective***
3. **Imagining reader/audience***
4. **Asking questions - information seeking***
5. **Approving/signing off on***
6. **Pointing out problems***
7. Being friendly
8. **Prompting student to read aloud***
9. Goal setting/agenda setting
10. Complimenting
11. **Drawing attention***
12. Stage managing
13. Joking & laughing
14. **Deferring to authority - student's expertise***
15. Word processor
16. Professional development
17. **Deferring to authority - student's major professor***
18. **Pointing out genre patterns***
19. Talking about graduate student life

Figure 5

GWC Consultant Practices, as Recalled by Ph.D. Student Participants in Follow-up Interviews



6.0 Discussion

This study's aim was to evaluate writing tutoring as a supplement to traditional doctoral dissertation supervision. By focusing on doctoral writers and examining the impacts of tutoring on individual writing projects rather than on general writing skill development, this study contributes in a novel way to a robust literature examining the impacts of writing center tutoring on academic outcomes.

Consultations were analyzed across four cases, each including three writing consultations, to identify the practices deployed in GWC consultations. The findings show that consultants used a wide variety of practices, most of which directly engage the text. Accordingly, this study reinforces Mackiewicz and Thompson's (2015) schema for characterizing what they call "tutor talk." In line with other scholars in this vein (e.g., Bleakney & Peterson Pittock, 2019), the present study expands the tutor talk schema to reflect practices specific to the CCE, including non-text engaged practices. With its focus on rhetorical moves as an indicator of genre competence, this study also highlights the CCE consultant practice of *pointing out genre patterns*, which was observed in all four cases and aligns with Bryan Malenke et al.'s (2023) endorsement of genre training for writing tutors. The findings likewise reinforce the notion that cognitive scaffolding-type practices—such as *asserting perspective*, *asking questions*, and *drawing attention*—were more frequent than instructive practices, such as *explaining* and *suggesting*. Practice frequency may relate to the language background of the Ph.D. student participants, all of whom were non-native English speakers (Thonus, 2004). Thompson and Mackiewicz (2022) observed that tutors tend to shift away from stronger, instructive approaches once students exhibit independence. Thus, the

co-occurrence of instructive and scaffolding practices indicate that tutoring is focusing on aspects of writing where the student has a real need.

To consider the nature of textual revisions over the course of the study, texts were coded to assess genre conformity and writing quality. All four students' revisions involved both rhetorical moves and QDTs, consistent with previous studies examining genre-based writing instruction and revision (Cotos et al., 2020). Revised draft versions reflected increases and decreases in both types of genre competence indicators, suggesting that writers were attentive to these aspects of writing quality while revising. These findings concern revision frequency, not holistic draft quality. Additionally, because the study size was small and the participants did not constitute a representative population sample, it is not possible to generalize from these findings or rely on them to predict how other Ph.D. students might revise following a GWC consultation.

When drawing direct connections between consultations and student revisions, at least two instances were identified for each case in which revisions were made to parts of the draft that had been discussed during consultations. These instances reflect the clearest, most explicit links between consultations and subsequent revisions, but they do not constitute a comprehensive list of all possible links. A detailed analysis of these connections underscores that both scaffolding and instructive practices (Mackiewicz & Thompson, 2015) were linked to quality-enhancing text revisions. Recalling their tutoring sessions and subsequent writing processes, all four student participants affirmed the influence of tutoring while maintaining ownership over their writing. This analysis did not attempt to show statistical correlation between tutoring practices and revisions; not only did the study's size of four cases lack statistical power, but also the interventions were not controlled experimentally. Thus, the connections described in the findings should be interpreted as circumstantial evidence rather than as proof that the tutoring practices directly affected draft quality.

Investigating students' recall of their consultations and subsequent writing processes enabled a glimpse at what they considered their uptake from tutoring and whether they attributed their writing choices to tutoring or another cause. In their interviews, the student participants identified many of the same practices observed in the tutoring sessions. The two most frequently used practices—*asserting perspective* and *suggesting*—were also the most frequently recalled by students, though in reversed order. Students may have extrapolated suggestions from consultants' asserted perspectives or simply have found suggestions more actionable than asserted perspectives when it came to revising their dissertations. All four students recalled that their consultation influenced their writing process, and they acknowledged other influences, such as guidance and feedback from their supervisors.

7.0 Conclusions

This study used a tracing design to investigate the potential for GWC tutoring to supplement traditional doctoral supervision with respect to dissertation writing. Prior research has established the positive impact that writing center tutoring can have on writing skills; however, less is known about tutoring's impact on individual writing projects. This study utilized digital tools for data collection and analysis to trace connections from tutoring to revision to recall. Findings reflect patterns in how consultant practices were deployed and received by students, with certain practices, such as *asserting perspective* and *suggesting*, emerging as prominent themes. The analysis of students' draft versions revealed that their revisions addressed features of writing quality known to impact dissertation evaluation, namely, rhetorical moves and QDTs. The scope of this study, encompassing only four case studies, does not support inferences of generalizability or causation; however, the successful use of writing analytics techniques in this context suggests that

the approach may be scalable, enabling a larger study with a representative sample of Ph.D. students.

This study relied on various digital technologies to investigate tutoring at a granular level. Video conference software enabled simultaneous presentation and recording of digital content, such as document files and media. Its multifunctionality enhanced consultation analyses by capturing the speakers and the focal writing project in one view. In the last phase of data collection, video conference software provided a convenient mode for presenting participants with stimuli and recording their responses. Additionally, the ability to digitally compare draft versions made it feasible to analyze changes in lengthy writing projects diachronically, contrasting with prior tracing studies that included just one tutoring session for each participant (Williams, 2004). Such digital tool use for writing analytics complicates the close reading (analog) vs. distant reading (digital) dichotomy (Drucker, 2017; Moretti, 2013). Using digital applications in a qualitative research design enables a context-rich close reading that accounts for interpersonal and technological influences on the writing process and product.

Challenges with writing, including process-related issues and difficulties with language, are believed to impede doctoral dissertation writing (Gürel, 2011; Komba, 2015; Lee & Swales, 2006; Wang & Parr, 2021). Collectively, the data from these four case studies present a logic model wherein GWC tutor practices drew students' focus to indicators of genre competence, motivating revision choices that improved the quality of their dissertation drafts. This follows the scaffolding model described in Thompson and Mackiewicz (2022), initially proposed by Wood et al. (1976), wherein writing tutors respond to students' learning needs with strong initial support, then gradually reduce support as students gain independence. All student participants in this study responded to writing and language support from their tutors, both in their dissertation revisions and in their recall. Selem, Dafina, and Fajar specifically contrasted their experiences discussing their writing with a tutor vs. their supervisor, noting that the lower power differential between student writer and peer tutor allowed for productive openness. All four Ph.D. student participants had prior experience with GWC tutoring; thus, as self-motivated to seek help from this resource, they may have been more receptive to tutor feedback compared to students who do not independently use GWC tutoring support.

It is important to note two limitations of the study stemming from the use of a nonrepresentative sample of doctoral students who use the GWC in the four case studies. Limitations regarding data representation and sample size preclude drawing inferences about a causal relationship between the intervention and the subsequent text revisions. Additionally, it is not assumed that data saturation was achieved; rather, there is a need to more fully explore the phenomenon of how and why Ph.D. students revise dissertation drafts following peer tutoring. In particular, more research is needed to explore whether and how different tutoring practices relate to textual outcomes, accounting for variance stemming from writers' nationality and language backgrounds, especially given prior research on the influence of these factors (e.g., Patrick, 2020; Thonus, 2004; Zhang et al., 2020). These findings serve to illustrate how GWC support could feasibly complement faculty supervision for dissertation writing.

8.0 Directions for Further Research

Future research should seek to establish more robust evidence that individual tutoring engenders independence in scholarly writing. High-level quantitative approaches exemplified by Overbay and Thurley (2024), Paoli and Kenigsberg (2024), and Zuccarelli et al. (2022) could be used to determine whether such an effect is generalizable. This could be achieved with a large dataset and a representative sample of Ph.D. student participants to ascertain whether specific classes of practices, such as instructive or scaffolding, significantly impact writing quality in subsequent

revisions. A larger-scale study could also establish whether individual differences, such as language background and discipline, mediate or moderate Ph.D. students' uptake from GWC tutoring. More broadly, this study suggests how writing analytics techniques might be used to evaluate other forms of doctoral writing instruction. Student participants in the present study contrasted their experiences with GWC tutors to their experiences with faculty supervisors; student uptake in contexts with variable power dynamics could be another valuable direction for writing center research. These future directions have strong potential to enhance how GWC tutors and other educators approach supporting doctoral students as writers.

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Appendix

Sample Question Set for Stimulated Recall Interview

Preliminaries

1. Thank you for participating in this follow-up interview. First, I'll explain how the interview will work.

Last spring, you met with the CCE tutor, **[Consultant NAME]**, over Webex, on three occasions: [DATE], [DATE], and [DATE]. On the date of each meeting, you provided me with the drafts of your dissertation, which you also discussed with the tutor.

Earlier today, I shared a folder with you containing some files modified from the data I collected during your participation, including video clips from your consultations and excerpts from your dissertation drafts. During this interview, we will review the files I shared as we discuss your reflections on your experiences with the tutor.

The interview has two question sets. In each question set, you will look at an excerpt from a draft that you provided to me. Then, together we will watch the video clip, where you discuss that excerpt with the tutor. We will watch the video twice, once straight through, and then again, and I will ask you to pause the video on the second watch-through to talk to me about any reflective thoughts that it provokes.

Finally, we will look at a later version of your dissertation draft where you have modified the section of the text you discussed with the tutor, and I will ask you to reflect on the revisions you made. You can request that I show you an image of your revised draft with the changes depicted visually (similar to a "track changes" view of the file).

Before we move on, what questions or concerns do you have about this interview?

2. Before we start the stimulated recall, please talk to me about what you recall about your writing consultations on [DATE], [DATE], and [DATE]. In particular, was there anything you remember from the consultation that you feel affected your revising of your dissertation draft?

First Question Set

Review the pre-consultation draft.

1. Review the following text excerpt from your draft provided on [DATE] (open the Word file, "[NAME] Dissertation Interview Question 3"): **[Excerpt from "before" version of draft]**

2. What can you recall about the concern that you had about this paragraph? If you don't remember, don't worry; you will have a chance to watch a video where you discuss it with the tutor.

Watch the excerpt from the consultation.

3. Now, let's watch this video excerpt from your consultation (open the video file, "[NAME] Dissertation_Interview Question 5").
4. Please talk about how you interpreted the tutor's response to the concern you expressed.

Review the post-consultation draft.

5. Now, review the following text excerpt from your draft provided on [DATE] (open the Word file, "[NAME] Dissertation_Interview Question 7"): **[Excerpt from "after" version of draft]**
6. What can you recall about your revision decisions for this paragraph? If you would like to see a visualization of your revisions, I can supply one.
7. What, if any, connection exists between the revisions you made to this excerpt and your consultation with the tutor?

Second Question Set (replicates the first question set)

Wrap-up

1. Is there anything else you may remember and want to tell me about your writing process at the time, whether it is related to your experience with the tutor or to other experiences beyond the CCE?

2. How has your approach to writing, or your knowledge about writing, changed since then?