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Faculty perceptions of common challenges encountered by novice doctoral writers

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Although learning to write for publication is an important outcome of doctoral education, it has received surprisingly little scholarly attention. Within a socialization and supervisor pedagogy framework, this study uses narratives of faculty who regularly write with their doctoral students for publication to expose challenges students commonly encounter in the writing process. Common challenges include international students' 'writing problem', misconstruing the nature of disciplinary writing and not realizing that 'public' is part of publication.

Keywords: academic writing; doctoral education; publication; STEM; supervisors

Introduction

Learning to write for publication is an important outcome of doctoral education (Kamler, 2008). At a fundamental level, codified written text preserves and transmits disciplinary knowledge (Norris & Phillips, 2003). At a pragmatic level, publication prior to graduation is a growing expectation for those with aspirations to enter the academy (Nettles & Millett, 2006). Further, publication counts are increasingly used as a measure of doctoral productivity and research quality (Aitchison, Catterall, Ross, & Burgin, 2012). However, while the study of writing at other educational levels has received longstanding and extensive scholarly attention (e.g., Emig, 1971; Flower & Hayes, 1981), attention directed toward doctoral writing, for publication or otherwise, is surprisingly limited (Aitchison, Kamler, & Lee, 2010; Kamler & Thomson, 2006; Parry, 1998; Rose & McClafferty, 2001).

For doctoral supervisors who foster doctoral publication, the challenges are numerous and deep-seated. Most receive no formal pedagogical training to support students' instruction in disciplinary writing (Lee & Aitchison, 2009). They themselves often learned disciplinary writing through trial and error, with little or no explicit guidance from their own supervisors (Starke-Meyerring & Paré, 2011). However, far from being an easily acquired generic skill, disciplinary writing is a complex social practice encompassing issues of epistemology, power and identity (Aitchison et al., 2010; Cotterall, 2011; Kamler & Thomson, 2006; Lee & Aitchison, 2009; Parry, 1998). To reach publication, students must learn and appropriately respond to often tacit expectations underpinning disciplinary writing (Delamont & Atkinson, 2001; Elton, 2010;

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Parry, 1998). Writing conventions must be heeded, and ‘voice’ and authoritative stance must be appropriately conveyed (Cotterall, 2011). Additionally, writing for publication is a high stakes, often stressful, public practice (Lee, 2010). With these concerns in mind, we seek to illuminate faculty supervisors’ perceptions of the challenges doctoral students encounter as they write for publication. In doing so, we strive to offer insight to students, supervisors and those who support their engagement in doctoral publication practices.

Contextual background and conceptual lens

While disciplinary differences in writing norms and conventions exist (Becher & Trowler, 2001; Parry, 1998), an increasingly universal concern centers on the quality of doctoral writing. For example, in her study of dissertation quality criteria employed by doctoral supervisors in Sciences, Social Sciences and Humanities, Lovitts (2007) observed: ‘one theme – the quality of doctoral students’ writing – came up so frequently that it deserves special attention. Faculty ... had something to say about it – and it was not complimentary’ (p. 48). Therefore, while we locate this study within narratives of Science, Technology, Engineering and Mathematics (STEM) faculty supervisors, we contend that our findings apply to doctoral supervision across disciplines because, as Paré noted: ‘in a very real sense, doctoral supervisors are writing teachers’ (2011, p. 59).

We invited STEM doctoral supervisors to serve as study participants because these supervisors and their research cultures may be particularly well situated to offer rich and revealing insight into students’ development as disciplinary writers. Two common practices in STEM doctoral education undergird faculty involvement in student writing. First, many STEM doctoral students conduct faculty-directed inquiry in laboratory teams (Cumming, 2009; Pole, Sprokkereef, Burgess, & Lakin, 1997). This work often results in multi-authored publications to which both supervisors and students contribute. Second, STEM doctoral dissertations often consist of a set of related articles the student has written for publication during doctoral tenure, and these articles are typically coauthored with the student’s doctoral supervisor (Golde, 2010). STEM doctoral supervisors, therefore, appear to commonly use faculty–student coauthorship to support students’ efforts to write for publication as a natural outcome of STEM doctoral education practices. While alternative ways to foster doctoral publication exist beyond coauthorship (see Lee & Kamler, 2008, for a comprehensive overview), we suggest that coauthorship is particularly well suited as a site for exploration of students’ development as disciplinary writers. As a collaborative author of text destined for publication, the doctoral supervisor is closely involved and invested in the processes and outcomes of student writing. Thus, doctoral supervisors who regularly coauthor with students could be expected to provide informed perspectives of students’ development as disciplinary writers.

We broadly frame this effort within the lens of socialization, frequently applied in the study of doctoral student experiences (e.g., Delamont, Atkinson, & Parry, 1997; Gardner, 2009; Weidman, Twale, & Stein, 2001). However, we note the criticality of supervisor pedagogy to the undertaking of doctoral disciplinary writing, and concurrently use this theoretical framing to interpret study findings. Austin and McDaniels (2006) define socialization as ‘a process of internalizing the expectations, standards, and norms of a given society, which includes learning the relevant skills, knowledge, habits, attitudes, and values of the group that one is joining’ (p. 400). As doctoral writers, the society that students aspire to join is that of the scholars creating,

through publication, the discourse community of their chosen discipline. Disciplinary socialization is posited to occur through a phase-driven process roughly aligned with time points within a doctoral program (Austin & McDaniels, 2006; Gardner, 2009; Weidman et al., 2001). All socialization phase models include an entry or beginning phase of orientation to programmatic expectations, and middle period, within which the student first undergoes a formal acquisition of core disciplinary knowledge followed by an informal acquisition of implicit disciplinary role expectations (i.e., Weidman et al., 2001). All conclude with a phase in which a student makes an original research contribution to their discipline.

While socialization is the process of internally aligning oneself with one's societal context, within the context of doctoral education, the supervisor is the pivotal influence underpinning a student's scholarly and professional development. As Lee (2008) succinctly stated: 'we know that the supervisor can make or break a PhD student' (p. 267). If, as Paré (2011) states, doctoral supervisors are writing teachers, then the pedagogical approach they apply to guide and shape students' writing efforts will be important to consider in an exploration of their perceptions of students' challenges with disciplinary writing. In this study, therefore, we apply a phase-driven disciplinary socialization framework to doctoral students' development as they write for publication, to explore the temporal development of writing with an attendant focus on supervisor pedagogy. With each phase, we pinpoint the struggles supervisors perceive that students encounter as students write for publication.

Method

This effort originated from a larger project examining the impacts of STEM graduate students' teaching and research experiences on research skill development (Feldon et al., 2011). Within the larger project, analysis of faculty descriptions of students' research skill development revealed that many STEM faculty used faculty–student coauthoring to expedite student research skill development (Maher, Timmerman, Feldon, & Strickland, 2013). Faculty coauthored with their students to strengthen students' research, writing and collaboration skills while establishing the student's publication record. However, they appeared to use coauthorship for more than developing writing skill and expanding a curriculum vitae. They also used coauthorship as a mechanism through which to facilitate the development of their students as scientific scholars.

We began with an original sample of 17 STEM faculty supervisors in the larger study described above who self-identified as using faculty–student coauthoring to expedite student research skill development. To expand the sample, we asked these participants to identify other faculty in their respective departments who wrote with doctoral students; 18 additional faculty were identified, and when contacted, agreed to participate. Of the 35 faculty participants, 11 were drawn from Science (astronomy, biology, chemistry, exercise science, geography, medicine and physics); 13 were drawn from Engineering (civil, chemical, electrical, mechanical and nuclear) and 11 were drawn from Math and Statistics. Six served as assistant professors, or lecturers, 13 as associate professors, or senior lecturers, and 16 as professors. Seven (21%) were women. The smaller number of female participants reflects the reality that female faculty are underrepresented in STEM disciplines (Hill, Corbett, & St. Rose, 2010). All served as faculty at a large research-intensive university (Carnegie Classification Research University/Very High [RU/VH], formerly known as 'R1') in the

southeastern USA (Carnegie Foundation, 2012). All had established a record of publication that included multiple works coauthored with their doctoral students with the exception of a pre-tenured math faculty participant who had one publication coauthored with a doctoral student. We focused on faculty who coauthored with doctoral students (as opposed to master's degree students) because the ability to master academic writing is especially important to doctoral students, as their work is 'judged in terms of its contribution to the field of knowledge or practice that it inhabits' (Lee, 2010, p. 17).

We interviewed each faculty participant either in person or by telephone, with interviews lasting from 20 minutes to almost an hour. The interview questions were developed through an ongoing review of relevant literature on STEM faculty–student coauthoring (e.g., Aitchison et al., 2012; Chaopracha, 1997; Florence & Yore, 2004; Kamler, 2008) and our own experiences as faculty members who coauthor with doctoral students. We asked faculty for in-depth descriptions of their experiences coauthoring with doctoral students, eliciting faculty perceptions of what students learn and how they develop as scientific writers through the coauthoring process. With participant permission, responses were recorded and transcribed.

Analysis began with interview transcription, as transcribing 'is not an antecedent to analysis, but it is a central aspect of the ways that researchers analytically orientate to data' (Gibson & Brown, 2009, p. 125). During transcription, the first author noted not only verbal content, but also emotional emphasis to discern undertones of both struggle and success. As Aitchison and her colleagues observed, questions about doctoral writing elicits, 'an abundance of heartfelt responses' (2012, p. 4). We next used the constant comparison approach (Glaser, 1965) to identify themes in faculty narratives, constantly comparing and contrasting emergent themes both within and across transcripts. We anticipated that our analysis would yield a list of competencies, such as that offered by Austin and McDaniels (2006) in their consideration of doctoral student preparation for the professoriate. Instead, as our understanding of transcript data evolved, we began to recognize evidence for the existence of an interconnected series of larger themes, each of which could be framed as a developmental phase through which students transition as they write for publication with their faculty supervisor. To ascertain the trustworthiness of our interpretation, interviewed faculty members provided member checking (Maxwell, 1996) through their review of themes.

Findings

We present our findings within three time points in the process of writing for publication that roughly aligned with phases of disciplinary socialization: initiation, midway and finalization. Within each, we pinpoint the struggles supervisors perceive that students commonly encounter as students write for publication.

Phase I: initiation to writing for publication

Regardless of when writing for publication was initiated in students' doctoral tenure, supervisors overwhelmingly perceived that students possess the intelligence, foundational content knowledge and technical skills to undertake writing for publication. Given the admission standards for programs represented in the study, this may be expected. Many supervisors described their students in terms echoing those offered by an engineering professor: 'very bright; strong mathematically and computationally'. Supervisors reported that some students, however, lacked familiarity with English,

a reflection of the fact that across study sub-disciplines, non-native English speakers comprised the majority of enrolled doctoral students. For example, 36 of the 48 (75%) students enrolled in the civil engineering doctoral program were reported by that program's graduate director as non-native English speakers. The large number of non-native English speaker figures reflects both the expansion of international student mobility and the international competition to attract foreign students, especially in STEM disciplines (National Science Board, 2012).

Supervisors' comments about non-native English students' experience with writing in English for their discipline indicated that this is a complex and multi-layered area. Some supervisors noted the danger of allowing language skills to obscure ability:

In hard sciences, increasingly, there are students who are not good in English. Some of my best students are Chinese students, from mainland China, and they have remarkable minds, but their English is so poor that at face value, one might be apt to dismiss them. (Physics professor)

Others offered observations suggesting that either lack of language skills or lack of familiarity with disciplinary writing patterns as they are practiced in North American scientific contexts may be a consideration:

I don't think he [student] understands English well enough to correctly interpret what other [journal] papers are saying, what reviewers say, or their response to his manuscripts. He will say, 'I addressed this reviewer comment' and I will review the comment and he kind of missed the boat on what the reviewer was saying. (Engineering professor)

Others reported using various pedagogical approaches with non-native English speaking writers:

Originally, he [non-native English speaking student] was just an outright terrible writer ... I helped him in organizing sentence by sentence, segment by segment, and I can tell you that he completely transformed his writing, *completely* transformed his writing. I have never seen a bigger transformation than I have in that student. (Engineering professor)

I have [non-native English speaker] start with an outline and then revise their outline, and then from that outline, they start writing drafts of each section, and then we would go through and talk about each of those. And that hasn't been very successful for me so far, and I had to get some of these papers out, and so I have really just ended up writing a lot of it myself. (Engineering professor)

As a further complication of the place of language skills in writing, familiarity with the English language did not assure satisfactory student writing outcomes:

I am just finalizing a paper written by a US born-and-raised student. That is requiring much more effort to put it into an acceptable form than then the paper of the foreign-born, especially after they [foreign-born] have spent some time here [in the US]. (Engineering professor)

A more universal concern was supervisors' perceptions about students' writing skills. Comments such as offered by a statistics professor: '[most] doctoral students we have are not great writers of research papers or not great writers in general' and an engineering professor: 'our graduate students don't have the same writing skills as in the past'

were common in faculty narratives. Supervisors attributed students' struggles to write – both in general and more specifically for their discipline – to a pronounced lack of disciplinary writing experience. Comments such as provided by an engineering professor: 'they [students] probably haven't done too much technical writing before', a statistics professor: 'most of our students are not that well acquainted with the conventions in our field for academic writing', and a mathematics professor: 'students have never written for publication before ... basically, they don't know where to start' were common throughout supervisor narratives.

Given the above, it is perhaps unsurprising that supervisors perceived novice writers to situate the task of writing for publication within the familiar parameters of previous academic performance measures. As a statistics professor observed: 'we have students who come in and they are really smart and they do great on the qualifier [exam] and they do great on the homework and they see this [writing for publication] as an extension of homework'. Examinations and homework are common educational assessment techniques that, while valuable to facilitate retention of core knowledge, represent the 'stable and controlled world of the undergraduate curriculum' (Delamont & Atkinson, 2001, p. 88). In contrast, novice disciplinary writers quickly found that writing for publication was quite a different and less bounded experience.

Supervisors perceived that novice disciplinary writers struggled to orient themselves to the iterative nature of authentic writing. As one engineering professor observed: 'students view it [writing for publication] like a homework problem, where if you make a good attempt and bring it back, you are done'. Others elaborated:

With a [more advanced] student, if I edited portions of a paper ... she understood that to mean that what she had written needed to be changed in those ways. But it was still a fluid document, so she had my complete approval to ... add a new section. Or, if she decided that even though I had edited a part, it really didn't belong in the paper and she should just delete it, she was free to do that. It was still her live document. With the [less advanced] student, she had a different understanding. Once I had edited it [the document], it was static. There was no changing it, and progress stopped on that portion of the document. (Medical professor)

It [writing] was very frustrating for her [student] because I would say, 'Ok, I think it should look like this' and she would send it to me, and I would say, 'No, that really doesn't look good' and she would say, 'But you told me to do it that way.' So she didn't recognize the iterative process, the fact that there isn't always one right way. The data might look better one way to make your point versus another, so that was very frustrating for her, that iterative process. Unfortunately, she got to the point where she said, 'I am not going to do anything because [professor's name] is just going to change it anyway.' So that is an extreme case – just not understanding the iterative process in writing. (Engineering professor)

In a related vein, supervisors perceived that novice disciplinary writers often 'passively participate' in the writing process and lack a sense of agency and ownership. Passive participation was observed in various circumstances and attributed to various causes:

We [myself and my student] can plan a campaign which is a shorter set of experiments to be done, and I can trust him [the student] completely in terms of being able to plan the details and execute it. But what do the results mean, and what are the deeper scientific and engineering questions that need to be asked as a result of his work? He needs to take that next leap where not only is he taking ownership on an operational basis, but ownership on an intellectual basis. (Engineering professor)

She [student] comes from a very different background ... She is much more of a respectful person, and she tends to be unsure of herself. So if I say something, she takes that as the absolute truth, and sometimes I am wrong, but she doesn't say anything. So the respect card comes into the picture too much. But she is getting better at asking me questions when she doesn't understand, and sometimes I say, 'You are right, I was wrong.' She is getting braver in that sense. (Mathematics professor)

A student comes in and says, 'I created one [a graph for a paper]' and I say, 'Well, that really doesn't illustrate what we need, does it? Maybe what we need is to try this instead? That just looks weird.' And the student says, 'Yes. I thought that looked weird. I thought we needed to do it a different way.' And I say: 'And you didn't *do it* a different way?' She [the student] is just in this mindset, where it is a homework assignment and she does it, and she comes back. (Engineering professor)

Phase II: midway on the path to publication

As collaborative writing efforts progressed, supervisors perceived that students framed their early writing contributions within accounts of research procedures. As an engineering professor noted: 'students tend to approach it [writing] as "What did I do?" They are very keen on the "What did I do" kind of stuff, and that is not what anybody is interested in reading.' A mathematics professor observed: '[much] goes into writing a paper beyond just proving a result'. A second engineering professor concurred: 'you are not just publishing your lab notebook'.

Supervisors perceived that students struggled to make larger sense, or a story, out of their research. As a physics professor observed: 'students need to ... make a convincing story about what needs to be known, what was produced; [they need to] convince people that the result is solvent'. Becoming a successful scientific storyteller required students to recognize which material to highlight and which to de-emphasize. As a professor of medicine noted: 'in writing a paper ... you need to cull through the data and decide what story it is telling you, and what the most important pieces are to show people'. An astronomy professor added: 'students learn how to not become lost in the details that would seem really important to them, but may not be that interesting to a reader, how to figure out what is really important for their audience'. A statistics professor elaborated:

I tell my students writing with me that every research project comes down to telling the story of what you did, and you don't want to tell it chronologically with all the false starts and everything that every research project involves. You want to think about what are the most important things that you learned from doing this research and that is the thing that you want your reader to understand above all, and that has to be emphasized.

Supervisors perceived that students were initially startled when counseled to frame writing as a story. An engineering professor advised: 'the paper is kind of a story; it is storytelling'. When asked if students are surprised to hear him characterize scientific writing as a story, he responded:

That's true – they always make the face, but it just lasts a few seconds. The face is always the same for all of them. They are always a little bit surprised, but then the surprise lasts just a few seconds because they probably realized that immediately. It makes sense. And I say: 'Take the time to prepare a good plot for your story.'

Supervisors also perceived that many students failed to recognize published studies in their discipline as prior chapters in the story they themselves were telling. Thus, supervisors strove to impress upon students the crucial need to read their discipline's primary literature as they wrote. As a statistician responded when asked what students learn through coauthorship: 'they learn you have to read like crazy'. Reading 'like crazy' facilitated students' ability to position their work within the context of written disciplinary dialog. In like fashion, supervisors perceived it as critical that students realize the need for the text they wrote to align with – and then expand – current disciplinary dialog. As an engineering professor observed:

Students need to be able to ... take previous literature and extend it a little bit ... take something that has already been done and say, 'Ok, how can we extend this to be able to solve these other cases or be able to solve that type of problem?' So, be able to merge two different technologies or be able to synthesise mathematical equations with some experimental data and come up with something else, basically.

Finally, supervisors perceived it as critical that students realize that the text they wrote must capture the reader's attention. As an astronomy professor noted: 'they [students] need to put the problem into perspective and explain to the reader why anyone should care about this'. A statistics professor elaborated:

I tell the students to think of the following: When you have someone reading your paper, at the end of the introduction, they have to be excited about moving on to section two. If they are not excited, why should they continue to read your paper?

Phase III: finalization

As collaborative manuscripts neared completion, supervisors perceived that a few students failed to recognize that text submitted for peer review serves as a proxy for professional identity. As an engineering professor noted: 'I'm not going to submit something that's less than par with my name on it.' A second engineering professor elaborated:

I just said [to a student], 'Take my name off. I don't want to be associated with that paper. I don't think he fully appreciated that it is his reputation on the line when he submits that paper.'

Once the manuscript was submitted for peer review, supervisors perceived that their student collaborators were largely unaware of the revision process that almost always awaited them both. However, knowledge of the revision process is critical to reaching publication. As a physics professor commented, 'My doctoral advisor and postdoc advisor both worked with me extensively on dealing with the journal [revisions]. I try to pass that to my students. That is a non-trivial skill, and it isn't really something necessarily intuitive.' Others elaborated on how the revision process taught students the intricacies of contributing to disciplinary dialog:

When we submit publications, the student is involved in every aspect of the publication process, from responding to referee reports to helping me craft the letter to the editor, and so they are always involved with the entire publication process. They take the lead in responding to referee reports. (Statistics professor)

When the paper was first submitted, it came back with editorial comments and things that they [reviewers] wanted. In fact, it was interesting. There are strong groups that feel that

running trees by one software package is much more realistic than running them with the other. I think he [doctoral student] learned a good lesson in the field of phylogenetic tree. (Biology professor)

So even if you are very precise and you think you have written a very nice paper, the reviewers don't ... But then that is also learning skills, because how do you respond to it, how do you react? (Statistics professor)

Discussion

We contend that in an increasingly competitive international knowledge economy, the ability to write for publication – or the lack thereof – will profoundly shape both initial and long term post-PhD career opportunities. However, within doctoral education, pedagogical attention to writing for publication has been mostly neglected (Lee & Aitchison, 2009). Thus, not surprisingly, a recent large-scale assessment of US doctoral student productivity indicated that less than a third of US doctoral students had published in a refereed journal, either as a sole author or with others (Nettles & Millett, 2006). Further, low doctoral publication output characterizes doctoral programs in the UK, Australia and elsewhere (Lee & Kamler, 2008). While literature on doctoral writing is beginning to accrue (e.g., Aitchison et al., 2010; Kamler & Thomson, 2006; Paré, 2011; Starke-Meyerring & Paré, 2011), we concur with Aitchison and colleagues (2012) that: ‘we still understand relatively little about how doctoral students actually learn research writing, how supervisors “teach” or develop the writing of their students and what happens to students and supervisors during this process’ (p. 2).

Our study addresses a basic but central question underlying the formation of doctoral writing pedagogies: what are faculty supervisors’ perceptions of the common challenges encountered by novice doctoral writers on their path to publication? In this section, we highlight study findings that we believe significantly contribute to the dialog surrounding doctoral writing for publication. We acknowledge that this study is limited to the identification of perceived common challenges and does not address the concomitant identification and assessment of various responses available to faculty supervisors to ameliorate those challenges, which, though important, are beyond the current study’s scope.

International students’ ‘writing problem’

Faculty in our study reported that many students who struggled to write lacked familiarity with English used for publication. At first consideration, it is tempting to locate this ‘writing problem’ solely within the non-native English speaking student and reference language tutorials such as offered by Glasman-Deal (2010). However, closer scrutiny of faculty comments suggests that this ‘writing problem’ is likely multi-sited. Perhaps supervisors under-appreciate the extent to which students lack familiarity with the specialized and often tacit disciplinary writing conventions. Perhaps, the ‘writing problem’ may lie in faculty stigmatizing (even unconsciously) or making predictions about students’ capabilities based on their language or cultural background (Spack, 1997) (‘... [non-native English speaking students] have remarkable minds, but their English is so poor that at face value, one might be apt to dismiss them’). Perhaps in turn, faculty, unwittingly or not, at times limit students’ membership in the disciplinary community (‘... I had to get some of these papers out, and so I have really just ended up writing a lot of it myself’).

While English is ‘currently the international language of science’ (Day & Gastel, 2011, p. 219), its use as such can also be a site of tension within the doctoral supervisor–international student relationship. Supervisors in this study (many of whom were non-native English speakers) appeared either unaware or reluctant to acknowledge that the ‘writing problem’ of non-native English speakers is concomitantly located within larger issues of identity and power rooted in intercultural supervision (Cotterall, 2011; Halic, Greenberg, & Paulus, 2009; Manathunga, 2011).

Misconstruing the nature of disciplinary writing

In this study, faculty perceived that most students entered their doctoral programs unprepared to engage in authentic disciplinary writing. While an initial explanation might be that our sample was confined to STEM disciplines and the finding is, thus, a discipline-specific artifact, extant literature suggests otherwise. Of students across disciplines, those in STEM disciplines are more likely than their counterparts to publish prior to graduation (Kamler, 2008; Nettles & Millet, 2006). Therefore, if any student population should be prepared for disciplinary writing, it should be this one. What then can explain students’ approach to disciplinary writing as a mere homework problem?

We base our explanation on an understanding that writing is best understood as a process that is irrefutably shaped by its practices and purposes – or the genres – in which it is expressed. As Miller (1984) explained: ‘for the student, genres serve as keys to understanding how to participate in the actions of a community’ (p. 165). For the doctoral student undertaking writing for publication, the desired community is their disciplinary community; the actions of that community are discourse driven; the key that opens that community’s door to the student is the judicious deployment of an academic genre.

However, doctoral students’ exposure to previous disciplinary genres may now, without supervisor intervention, interfere with their acquisition of genres underpinning writing for publication. In the case of STEM students, as undergraduates, participation in scientific research and writing occurs within one or both of two contexts. A limited number participate in apprentice-style undergraduate research, but as Hunter, Laursen, and Seymour (2007) observed, these experiences typically require little or no formal writing. Almost all participate in carefully managed laboratory experiments with pre-determined outcomes, and almost all write routine laboratory reports to summarize prescribed findings. Thus, these students’ initial exposure to authentic disciplinary writing would understandably lead them to believe this type of writing is predictable and largely self-contained, like a homework problem.

STEM disciplines are not alone in subjecting early writers to ‘disingenuous genres’; the practice can begin in high school. Emig (1971), in her groundbreaking study of the writing process, delved into the writing practices of 12th grade composition students. Her findings are notable to the current study for two reasons. First, she vividly recounted the extreme reliance on the education writing practice of the five-paragraph theme (one paragraph to ‘tell what you are to say’, three paragraphs of ‘say it’, one paragraph to ‘tell what you said’). Emig notes that teachers insist that ‘this theme somehow fulfills requirements somewhere in the real world’ but then reveals, ‘If one takes a constellation of [the best fiction] writers of the [nineteen-]sixties, where, even in their earliest extensive writings, can one find a single example of any variation of [this] theme?’ In like fashion, where in the scientific publication record can one find any single example of a carefully managed laboratory experiment with pre-determined outcomes?

Second, Emig (1971) offers lucid insight into the extent of the revision or reformation process of her study participants. In short, there was little to none. In recounting the experience of a 12th grader, Emig wrote:

Lynn has a view of the writing process as a no-nonsense, no-dawdle task to which one devotes a given amount of time, and no more... Lynn does not voluntarily reformulate [her writing] because... she equates reformulation with 'punishment work' (p. 68)

In like fashion in our own work, students failed to realize the fluidity of text under production; instead, once written, as a supervisor observed of a doctoral student's mindset, 'there was no changing it, and progress stopped on that portion of the document'.

Realizing that 'public' is part of publication

Writing for publication is a high stakes public act that, not surprisingly, can elicit anxiety among students (Lee, 2010). Less commonly recognized is a circumstance in which students fail to recognize that 'public' is part of 'publication', and text submitted for peer review is a proxy for one's professional identity. As Aitchison and colleagues (2012) note, doctoral supervisors are typically very aware of protecting their own public identity when student writing is slated in the public domain. Their students, however, may be less apprised. Thus, faculty in this study perceived that a challenge for some students was realizing the extent to which scholarly identity and produced text are forever fused (Kamler & Thomson, 2006). Further, once the text was under peer review, many faculty perceived that students were largely unaware of the looming revision process (which is, in truth, simply an extension of the revision or reformation process described above). Much as disciplinary writing is a complex social practice, the art of 'brokering' the manuscript to publication through the perils of the revise-and-resubmit process is also an intricate social practice (Kamler, 2010). Faculty perceived that students were challenged to recognize the hidden dangers lurking in what Aitchison and colleagues (2010) term the 'unprotected space' (p. 8) between writers and editors, reviewers and others.

Conclusion

An astute reviewer of an earlier version of this manuscript offered, 'What is reported about writing is not new – the novelty is in the context of doctoral supervision and the development of writing for publication.' As we have learned through the revision process of this manuscript, writing for a specific genre, such as a journal article, must align with that genre's process, practices and purposes. However, with this article, we hope to emphasize that the writing, reading and reflecting about writing are necessary acts that belie the borders of time periods, disciplines or genres.

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References

- Aitchison, C., Catterall, J., Ross, P., & Burgin, S. (2012). 'Tough love and tears': Learning doctoral writing in the sciences. *Higher Education Research & Development*, 31(4), 435–447.
- Aitchison, C., Kamler, B., & Lee, A. (Eds.). (2010). *Publishing pedagogies for the doctorate and beyond*. New York: Routledge.
- Austin, A.E., & McDaniels, M. (2006). Preparing the professoriate of the future: Graduate student socialization for faculty roles. In J.C. Smart (Ed.), *Higher education: Handbook of theory and research* (Vol. 21, pp. 397–456). Netherlands: Springer.
- Becher, T., & Trowler, P.R. (2001). *Academic tribes and territories: Intellectual enquiry and the culture of disciplines*. Berkshire: Open University Press.
- Carnegie Foundation. (2012). *Carnegie classifications institutional profiles*. Retrieved July 20, 2012, from http://classifications.carnegiefoundation.org/lookup_listings
- Chaopricha, S. (1997). *Coauthoring as learning and enculturation: A study of writing in biochemistry*. Unpublished doctoral dissertation, University of Wisconsin, Madison.
- Cotterall, S. (2011). Doctoral students' writing: Where's the pedagogy? *Teaching in Higher Education*, 16(4), 413–425.
- Cumming, J. (2009). The doctoral experience in science: Challenging the current orthodoxy. *British Educational Research Journal*, 35(6), 877–890.
- Day, R.A., & Gastel, B. (2011). *How to write and publish a scientific paper*. Westport, CT: Greenwood Press.
- Delamont, S., & Atkinson, P. (2001). Doctoring uncertainty: Mastering craft knowledge. *Social Studies of Science*, 31(1), 87–107.
- Delamont, S., Atkinson, P., & Parry, O. (1997). *Supervising the Ph.D.: A guide to success*. Bristol, PA: Open University Press.
- Elton, L. (2010). Academic writing and tacit knowledge. *Teaching in Higher Education*, 15(2), 151–160.
- Emig, J. (1971). *The composing processes of twelfth graders* (NCATE Research Report No. 13). Urbana, IL.
- Feldon, D.F., Peugh, J., Timmerman, B.E., Maher, M.A., Hurst, M., Strickland, D., et al. (2011). Graduate students' teaching experiences improve their methodological research skills. *Science*, 333(6045), 1037–1039.
- Florence, M.K., & Yore, L.D. (2004). Learning to write like a scientist: a study of the enculturation of novice scientists into expert discourse communities by co-authoring research reports. *Journal of Research in Science Teaching*, 41(6), 637–668.
- Flower, L., & Hayes, J.R. (1981). A cognitive process theory of writing. *College Composition and Communication*, 32(4), 365–387.
- Gardner, S.K. (2009). *The development of doctoral students: Phases of challenge and support*. San Francisco: Jossey-Bass.
- Gibson, W.J., & Brown, A. (2009). *Working with qualitative data*. Thousand Oaks, CA: Sage Publications.
- Glaser, B.G. (1965). The constant comparative method of qualitative analysis. *Social Problems*, 12(4), 436–445.
- Glasman-Deal, H. (2010). *Science research writing for non-native speakers of English*. London: Imperial College Press.
- Golde, C.M. (2010). Entering different worlds: Socialization into disciplinary communities. In S.K. Gardner & P. Mendoza (Eds.), *On becoming a scholar: Socialization and development in doctoral education* (pp. 79–95). Sterling, VA: Stylus.
- Halic, O., Greenberg, K., & Paulus, T. (2009). Language and academic identity: A study of the experiences of non-native English speaking international students. *International Education*, 38(2), 73–93.
- Hill, C., Corbett, C., & St. Rose, A. (2010). *Why so few? Women in science, technology, engineering and mathematics*. Sponsored by the American Association of University Women. Retrieved November 25, 2012, from <http://www.aauw.org/learn/research/upload/whysofew.pdf>
- Hunter, A.-B., Laursen, S.L., & Seymour, E. (2007). Becoming a scientist: The role of undergraduate research in students' cognitive, personal, and professional development. *Science Education*, 91(1), 36–74.

- Kamler, B. (2008). Rethinking doctoral publication practices: Writing from and beyond the thesis. *Studies in Higher Education*, 33(3), 284–294.
- Kamler, B. (2010). Revise and resubmit: The role of publication brokers. In C. Aitchison, B. Kamler, & A. Lee (Eds.), *Publishing pedagogies for the doctorate and beyond* (pp. 64–82). New York: Routledge.
- Kamler, B., & Thomson, P. (2006). *Helping doctoral students write: Pedagogies for supervision*. New York: Routledge.
- Lee, A. (2008). How are doctoral students supervised? Concepts of doctoral research supervision. *Studies in Higher Education*, 33(3), 267–281.
- Lee, A. (2010). When the article is the dissertation: Pedagogies for a PhD by publication. In C. Aitchison, B. Kamler, & A. Lee (Eds.), *Publishing pedagogies for the doctorate and beyond* (pp. 12–29). New York: Routledge.
- Lee, A., & Aitchison, C. (2009). Writing for the doctorate and beyond. In D. Boud & A. Lee (Eds.), *Changing practices of doctoral education* (pp. 87–99). New York: Routledge.
- Lee, A., & Kamler, B. (2008). Bringing pedagogy to doctoral publishing. *Teaching in Higher Education*, 13(5), 511–523.
- Lovitts, B.E. (2007). *Making the implicit explicit: Creating performance expectations for the dissertation*. Sterling, VA: Stylus.
- Maher, M., Timmerman, B., Feldon, D., & Strickland, D. (2013). Factors affecting the occurrence of faculty-doctoral student coauthorship. *Journal of Higher Education*, 84(1), 121–143.
- Manathunga, C. (2011). Moments of transculturation and assimilation: Post-colonial explorations of supervision and culture. *Innovations in Education and Teaching International*, 48(4), 367–376.
- Maxwell, J.A. (1996). *Qualitative research design: An interactive approach*. Thousand Oaks, CA: Sage Publications.
- Miller, C. (1984). Genre as social action. *Quarterly Journal of Speech*, 70(2), 151–167.
- National Science Board. (2012). *Science and engineering indicators 2012 (NSB 12-01)*. Arlington, VA: National Science Foundation. Retrieved November 25, 2012, from <http://www.nsf.gov/statistics/seind12/>
- Nettles, M.T., & Millett, C.M. (2006). *Three magic letters: Getting to Ph.D.* Baltimore: John Hopkins University Press.
- Norris, S.P., & Phillips, L.M. (2003). How literacy in its fundamental sense is central to scientific literacy. *Science Education*, 87(2), 224–240.
- Paré, A. (2011). Speaking of writing: Supervisory feedback and the dissertation. In L. McAlpine & C. Amundsen (Eds.), *Supporting the doctoral process: Research-based strategies* (pp. 59–74). New York: Springer.
- Parry, S. (1998). Disciplinary discourse in doctoral theses. *Higher Education*, 36(3), 273–299.
- Pole, C.J., Sprockereef, A., Burgess, R.G., & Lakin, E. (1997). Supervision of doctoral students in the natural sciences: Expectations and experiences. *Assessment and Evaluation in Higher Education*, 22(1), 49–63.
- Rose, M., & McClafferty, K.A. (2001). A call for the teaching of writing in graduate education. *Educational Researcher*, 30(2), 27–22.
- Spack, R. (1997). The rhetorical construction of multilingual students. *TESOL Quarterly*, 31(4), 765–774.
- Starke-Meyerring, D., & Paré, A. (2011, April). *Perceptions and Practices of Writing in Doctoral Education: Consequences for Students and Supervisors*. Paper presented at the annual meeting of the American Educational Research Association, New Orleans, LA.
- Weidman, J.C., Twale, D.J., & Stein, E.L. (2001). *Socialization of graduate and professional students: A perilous passage?* (ASHE-ERIC Higher Education Report 28, no. 3). Washington, DC: Association of the Study of Higher Education.