

Rethinking doctoral publication practices: writing from and beyond the thesis

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This article addresses the importance of giving greater pedagogical attention to writing for publication in higher education. It recognizes that, while doctoral research is a major source of new knowledge production in universities, most doctoral students do not receive adequate mentoring or structural support to publish from their research, with poor results. Data from a case study of graduates in science and education are examined to show how the different disciplinary and pedagogic practices of each discourse community impact on student publication. It is argued that co-authorship with supervisors is a significant pedagogic practice that can enhance the robustness and know-how of emergent scholars as well as their publication output. There is a need, however, to rethink co-authorship more explicitly as a pedagogic practice, and create more deliberate structures in subject disciplines to scaffold doctoral publication – as it is these structures that influence whether graduates publish as informed professionals in their chosen fields of practice.

Introduction

This article starts from the assumption that writing for publication is an important activity for established academics and doctoral students alike. Publications are increasingly used in universities to measure personal and institutional performance, and as a criterion for achieving academic promotion and competitive research funding. When the results of research are not published, there are diminished opportunities for the kinds of professional dialogue and knowledge building that can take a field forward. Nevertheless, McGrail, Rickard, and Jones (2006) report that, whilst a small minority of academics publish a great deal, publication outputs in general are quite low. In their review of published literatures, they cite a number of reasons why academics do not write for publication, including a lack of momentum, motivation and confidence, and the lack of a framework or formal structures to sustain and support writing.

Not surprisingly, low publication output is also a consistent feature of doctoral programmes in the UK, USA, Australia and elsewhere (Lee and Kamler 2007). It is widely recognized that doctoral research is a major source of new knowledge production in universities, and that research students are pivotal in establishing international collaborative links (Siddle 1997). Yet the results of doctoral research are not widely or systematically disseminated through peer-reviewed journal publication, and mentoring towards publication is not often a routine part of the process of doctoral education in the social sciences.

Internationally, there have been moves to develop doctoral degree programmes for publication (e.g. Powell 2004; European University Association 2005), in order to better prepare students for participation in research cultures. But, for the most part, doctoral students appear to be left to their own devices to sort out how to publish from their research (Dinham and Scott

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2001; Engestrom 1999), with poor results. Individual supervisors vary considerably in the support they give to writing for publication during and after the doctorate, as do different disciplinary communities.

Graduates of social work doctoral programmes in the United States, for example, were found to have low levels of scholarly productivity (Green, Hutchison, and Sra 1992). Green, Hutchison and Sras' cross-sectional survey canvassed a majority of social work graduates from American colleges and universities during a 28-year period, using a variety of measures of scholarly productivity to broaden more limited indicators employed in previous studies. A key finding was that significant numbers of doctoral graduates made no contribution in any of the categories of scholarship:

Significant and perhaps disturbing percentages reported that they had not presented papers at social work conferences (33%), nor had they published articles in refereed social work journals (47%) or non social work journals (47%); only 43 percent contributed chapters in books, with a minority publishing an original (24%) or edited book (16%). (Green, Hutchison, and Sra 1992, 457–8)

Green, Hutchison, and Sra concluded that the most important predictor of future scholarly productivity was success in publishing results from dissertations, and that publishing productivity could be stimulated during doctoral education. Two international surveys by Dinham and Scott (2001) confirm this connection between publishing support and increased productivity. Encouragement from supervisors was an important aspect of proceeding to publication, with 'those participants who received this assistance more likely to publish than those who did not' (53). The effects of institutional support were also marked. Universities with coherent policies encouraging postgraduate publication were few, but students who attended such institutions published more, both as students and graduates. Without policy support, publication was a hit and miss affair.

Other studies also indicate that critical feedback and attention to writing-in-progress has a significant impact on publication output and the formation of a scholarly identity. Page-Adams et al. (1995) report on a peer writing group, initiated by social work professionals undertaking PhD studies, to improve their publication during candidature. Eight of the 25 enrolled doctoral students who joined the group submitted or published 19 papers during the group's first year, compared to only five papers produced by the other 17 non-members. Evaluation showed a positive correlation between group membership, scholarly output and the capacity to make a contribution to professional knowledge early in one's academic career.

Lee and Boud's (2003) work with early career academics in an Australian university similarly demonstrates the significant impact of group pedagogies on developing effective publication strategies. Participants in their two writing groups were completing mid-career PhDs, held full-time positions at the university and were under pressure to develop research profiles. Both groups became rich sites for doing research development work, fostering publications and what Lee and Boud call 'the making and remaking of academic identities' (189).

Taken together, these studies suggest that doctoral publication is not a given. It flourishes when it receives serious institutional attention, and skilled support from knowledgeable supervisors and others who understand academic writing as complex disciplinary and identity work. In this article, I argue that greater pedagogical attention needs to be given to writing for publication, and that doctoral education is a significant place to intervene if we are keen to improve the low level of publication output documented by McGrail, Rickard, and Jones (2006) for all academics. Such pedagogic interventions, however, should be linked to the broader project of reinvigorating and rethinking doctoral pedagogies, and not just offer a set of tips and tricks to increase output in narrow and short-term ways.

To make this argument, I analyse data from a case study of graduates in science and education to illustrate how the different disciplinary and pedagogic practices of each scholarly community impact on the capacity of doctoral graduates to publish and become robust scholars. While there are multiple ways to foster doctoral publication (see Lee and Kamler 2007), the focus here is on co-authorship with supervisors – a dominant practice within the sciences, but one which has been perceived negatively within the social sciences, and education in particular, for ethical reasons regarding questions of ownership, autonomy and self-exploration.

I begin by discussing the theoretical framing and context of the research. I then tease out the different patterns of publication of graduates from these two discourse communities, the students' views of co-authorship and the ways co-authorship can scaffold student publication output.

The research context

During the past decade, there has been considerable research and policy attention given to improving the quality of doctoral education in Australia. This attention is not surprising, given the dramatic and unprecedented expansion in PhD enrolments, and the growing diversity of students (Pearson 1999) in terms of age, gender, nationality, disciplinary areas and part-time candidature (Evans 2002). In this context, my colleagues and I developed a research project called *Becoming authorised: an investigation of quality doctoral writing in education and science* (Kamler et al. 2003).

The research aimed to improve the quality of the doctoral experience for an increasingly diverse student population by foregrounding the process of writing. Although writing is an obvious dimension of higher degree work – and one widely recognized as an area of great anxiety for students – it is regularly overlooked (Kamler and Thomson 2006). We sought, therefore, to understand the experience of writing a doctoral dissertation *from the student's perspective*. We also aimed to investigate the links between the massive personal investment that goes into any thesis and the uses to which that writing is subsequently put.

Our research team were all located in education. We were concerned about the writing and publication output of our students, and keen to interrogate how our own practices of supervision might be shaping that output. In order to estrange ourselves from the practices of our discipline, we elected to investigate a discourse community with different practices. We chose science as a broad field of comparison, because the typical pattern of candidature in Australia differed markedly (Evans 2002) from that of education. While science students are typically younger, full-time, recent honours graduates, supported by scholarship, education students, by contrast, are typically part-time, mid-career, employed professionals who juggle academic and career responsibilities (Leonard, Becker, and Coate 2004), and potentially have less time to write.

We recruited recent graduates from four universities in a major metropolitan city in Australia, by sending letters to research directors and known supervisors in faculties of education and science, who then contacted students in order to reduce the possibilities of coercion to participate. Purposive sampling was used to select 12 participants, six mid-career doctoral graduates in education and six early-career doctoral graduates in science. Science graduates came from the fields of ecology, environmental studies, physics and biology; education graduates came from mathematics and cognition, early childhood, English literacy, technology and adult education. The sample did not take into account variations in either discipline, as the aim was to produce a fine-grained analysis of supervision pedagogies in the two broader discourse communities in relation to writing and publication.

It must be noted that we were not trying to compare disciplines in this research; the range of disciplines included under science is so broad as to render any generalizations to science practice

impossible. Further, education itself is an interdisciplinary field of practice, in which it is difficult to generalize across sub-fields. While the supervisory arrangements in the Australian system range from laboratory-based group supervision to single supervisory models, all the science and education students in this case study were supervised by one or two primary supervisors, and in this sense were comparable. We started with a broad understanding that the disciplinary pedagogies of science supported co-authorship and joint publication more frequently than in education – a supposition that was supported by this sample of students.

Research participants were interviewed twice. In the first interview, they discussed the process of writing the doctorate, how topics were chosen and how the relationship with the supervisor supported writing. The second interview focused on the writing published from the doctorate. Participants brought bibliographies of articles/publications written, both during candidature and after graduation, and discussed the support received, their experiences of co-authorship with supervisors and questions of authority and expertise that go with authorship.

The interview analysis was framed by two theoretical frameworks: a model of writing as discursive social practice, and a view of research writing as text work and identity work (see Kamler and Thomson [2006] for an elaborated discussion of these conceptual frameworks for doctoral writing and publication).

A view of doctoral writing as a discursive social practice (Fairclough 1992) framed our analysis of writing as a form of discipline-specific social interaction embedded in institutions and social structures. Students conduct research and write dissertations for a particular kind of academic public, with particular ways of being and doing scholarship that have been developed over time, within specific disciplines. The dissertation text is developed in conversation with supervisors, who literally embody the discipline and institution. In addition, the specific context, including the prevailing higher education policy regime and the relations of power which shape university cultures, also delimit what can be done in doctoral research and in doctoral texts and publications.

A view of doctoral writing as text work/identity work focused our attention on the connections between textual practices in a field and the formation of the doctoral scholar. Doctoral writers need to learn the sophisticated genres and textual conventions of their field – but they also need to learn how to take an authoritative stance in a field of expert others, and to assert their contribution to that field before they feel authoritative. Students find doctoral writing difficult because texts and identities are formed together, in and through writing. They feel vulnerable when their work is made public because the text is an extension of the scholar and scholarship; it literally puts the self and the work ‘out there’. From this perspective, the publication practices that a disciplinary community develops (or fails to develop) are significant in shaping not only the texts students produce – the dissertation that gets examined or the journal article that gets published – but also the scholars they become – their know-how and capacity to be strategic. We used these lenses to tease out key themes from the interviews with graduates.

Confidence about refereed publication

While all doctoral graduates in this case study presented conference papers and/or produced a number of published outputs from their theses, science graduates were far more successful in achieving international refereed journal publication. In general, the six graduates in science published more during the process of writing the PhD and aimed for more prestigious journals – in part, because their supervisors expected them to. Writing early in the research, and co-authorship with supervisors were seen as standard and important tactics in preparing for post-doctoral work, as is evident in this interview with a female graduate in physics:

- SCI:* At the end of my first year I had some results that were interesting so, my supervisor said, ‘why don’t you write a paper?’ And so I started to write this paper and that took about six months of very hard work. Just getting the technical expression correct and being precise. I went through about ten drafts and for one reason or another they were all pretty crap ... it was a hard process because I had to take a few knocks but I think in the end the paper was so much better for it. And when I think of that paper I think that was like my training ground for expressing myself in physics language.
- I:* So this particular paper when you got it published, where was it published?
- SCI:* It was published in the *Journal of Materials Research*.
- I:* Is that a prestigious journal in your field?
- SCI:* It is quite good. Initially I sent it to the *Journal of Applied Physics* which is the most prestigious in my field. But it was knocked back because I hadn’t properly grounded it and made it relevant to the rest of the literature. So *we* decided not to send it back after *we* had corrected it. And *we* agreed with all the corrections as well. Because I think *we* thought that if *we* got the same referee then it might just get knocked again, so *we* wanted to send it somewhere new and just have it out there and published.

In this account, the graduate emphasizes the value of mentoring for establishing a publication record and a professional identity. The process is described as a difficult apprenticeship (‘very hard work’, ‘a hard process’) initiated by the supervisor, where the inadequate writing (‘pretty crap’) needs to be shaped and disciplined (‘training ground’). What stands out is the recognition of the importance of learning to speak in discipline-specific ways and a framing of this work as collaborative. There is a marked shift to the plural pronoun *we* to describe the difficult work of getting published as a joint effort. The candidate knows the prestigious journals of her field and can survive rejection, because she has the support of her more experienced supervisor to guide her through the process. It is *we* rather than *I* who deals with the potentially devastating experience of being ‘knocked back’, as well as strategic decisions about resubmission. Taking joint responsibility appears to minimize the stress of rejection and enhance knowledge about the publication process.

Education graduates, by contrast, appeared more reluctant to submit their work to international refereed journals, had fewer strategies for doing so and received less supervisor support in the process – again suggesting a different view of publication in the education discourse community. One graduate, a male in the field of literacy and technology, produced over 49 workplace-based professional development sessions, based on his dissertation, but not one written publication from his thesis. In retrospect, he regretted this lack of publication deeply, even though he did not pursue an academic career. As he said:

- ED2:* I guess sometimes when I start to realize that I think I was a pioneer in that area and I haven’t used that and gone on with it, and even the stuff that I’ve done is not *really* out there, I regret that ...

The other five education graduates in the study did publish, but they often relied on what we might call ‘safe spaces’ for publication. A graduate in the field of adult education, for example, published three journal articles, but these all appeared in the *same* non-refereed professional journal. This journal was a ‘safe space’, in that she was a member of the professional organisation that published the journal and the readership was known to her. She articulated no desire to get her work out to a broader field of enquiry, or to seek the kind of refereed publication that was taken for granted by science graduates and is recognized in university quality audits as what ‘counts’.

Another graduate, in the field of literature and secondary education, also succeeded in producing three publications after graduation (one book chapter, one online journal, one professional journal). Her safety net was to rely on the invitation from others to write, including a request from her supervisor to contribute to an edited collection, and two invitations from professional

organizations following her successful presentations at their conferences. She, in fact, expressed fear and anxiety about writing for unknown others, and entering the domain of international refereed publication, a worrying outcome for a doctoral education that seeks to produce robust scholars and thinkers.

- EDI:* ... I've been approached to write every time. I haven't had to submit anything and, I suppose, my anxie- there will be anxiety when I sit down and do my, what I call my big article for a, a, uh, an international refereed journal, which I know I still haven't made any start on whatsoever. So I've done things that I thought I could manage, after being approached to develop that conference presentation into a refereed article and so on, and it's been very unthreatening in that sense.
- I:* No anxiety attached to writing them?
- EDI:* No, no. Because I'm staying within my comfort zone I think. I'm not going to *the big guns overseas where I'm, you know, a no one.*
- I:* But you sound as if you've planned to do an article for an overseas journal.
- EDI:* Well, I've certainly been urged, and I see the logic of it, but it's taking a lot of intellectual, well, emotional effort, to rethink my thesis in that kind of way. I want to move on. But it's foolish to have spent seven years on a piece of research that I've just taken little fragments from and not really tried to make it into a pithy article.
- I:* So it's on the agenda, but you haven't started it?
- EDI:* Yes.

In this account, the graduate articulates the importance of international publication, but can barely speak the words without stammering. In the absence of tangible supervisory support or a confident scholarly identity, she opts for less threatening opportunities that she can *manage* on her own. Her use of the phrase 'big guns overseas' evokes images of potential violence and hostility from those unknown in the global galaxy of publishing. They are represented as 'big', she is 'a no one'. This kind of negative self-representation was symptomatic of a worrying reluctance by all the education graduates to get their work out to the broader international community of inquiry – and echoes the findings of Dinham and Scott (2001), that, without appropriate institutional support, doctoral students are more likely to avoid the challenge altogether.

Co-authorship with supervisors

Co-authorship with supervisors played a significant role in this study in helping students in both science and education to produce refereed publications. As a group, the six science graduates published 13 articles in international refereed publications prior to graduation; all of these articles were co-authored with supervisors. Only two of the six education graduates published in high-profile international journals, but significantly, these two articles were also the *only* two co-authored texts in the education sample.

For the six science interviewees, co-authorship was a given. This co-authorship was not perceived as their supervisors 'taking their thunder' or diminishing the ownership of their work, but rather as a crucial part of learning the ropes of academic publishing. This well-established expectation of the discourse community was articulated by one male graduate in the field of ecology.

- SC2:* All of [my publications] have been jointly authored.
- I:* And who with?
- SC2:* Mainly supervisors and ah ... people ... one of the papers required the use of someone else's data, so I gave them, gave is not the right word, I considered that that contribution required co-authorship ...
- I:* And, do you think the assistance or advice [on publication] you got was valuable?

- SC2: Well, given that most of my publications relating to my PhD came out whilst I was working on my PhD, most of my assistance came from supervisors. And so it was using their experience in publishing to help me organize my own writing efforts. So, largely through my supervisors.

In this account, we hear a taken-for-granted expectation that ‘my supervisors’ will take a key role in assisting to publish. *All* of this graduate’s publications have been co-authored, and he indicates a strategic consciousness about using ‘their experience in publishing’ to boost his own profile. It was rare to find this kind of statement in education. In fact, two education graduates emphasized the absence of established practices of co-authorship at the Australian universities they attended.

- ED3: And even if I was doing those [articles] during the thesis time, I wouldn’t expect him to put time into developing my refereed journal articles. I think he spent ample time with me during my work so it’s just my expectations ...
- ED5: It wasn’t her traditional habit to have her name on papers as it is in some areas. I would have said she had made enough contribution to those papers to justifiably have her name on them, but in fact that’s not what happened. My name only was on them, but she read them and commented on them and made suggestions that heavily influenced them in that way.

While the kind of supervisory input described in these accounts would ‘count’ as co-authorship in many disciplinary communities, there is an articulated lack of expectation that education supervisors will play a key role in publication. ED3 foregrounds the student as the one who takes key responsibility, with any input from supervisors an added extra. ED5 points to substantial editorial labour received from his supervisor – and certainly *enough*, in his opinion, to be acknowledged as a joint effort. However, the discourses that circulate in education name that assistance as voluntary and not expected, hence not acknowledged as co-authorship.

Nonetheless, it was clear that the two education graduates who did achieve international refereed publication did so *because of* the scaffolding from co-authoring with their more experienced supervisor. One, a female graduate in the field of mathematics education and cognition, would not have persevered without this partnership.

- ED3: ... I think he probably suggested that I should have this written up for international journals and I probably said, I haven’t got much experience with that or something and he’s offered to help. There have been times when I’ve written stuff and he’s given me feedback on it and I’ve said, do you want your name on it or something and he said no, and this one he certainly didn’t you know. But the amount of work he did with me, so it just had to go on ...

We submitted it to them and two of the examiners loved it and two didn’t. And so they sent it back with this huge list of things *we* had to do and *we* did all of those things except a couple, because there’s always the discrepancy between examiners you know. And when it got sent back they sent it to some of the old examiners and some new examiners and again ... well *we* did a bit better this time, we got three who really loved it and one who didn’t like it and *we* don’t know if that was one of the original ones or not. But the editor decided that since it had been through twice and wasn’t welcomed with open arms, they wouldn’t accept it.

Two things stand out in this account. First, it is the candidate who insists on the supervisor being named as co-author. Even then, it occurs because his contribution is seen to be so substantial (‘the amount of work he did’), suggesting again how unusual this practice is in education. Second, a crucial outcome of the process is learning how to stay with the process and not be mortally wounded, despite rejection. The graduate represents the process as a collaborative effort, signalled by the shift to the pronoun *we* (like the account of the physics graduate SC1,

seen earlier in this article). The supervisor was adamant that the work was good and that they should resubmit it elsewhere. It was rejected two more times before it was finally accepted, almost two years after the first submission. Crucially, the supervisor's confident persistence accomplished a kind of identity work for the student, allowing her to perform the resilient scholar, even before she felt like one.

The other graduate, in the field of early childhood education, was encouraged by her supervisor to think about publishing from the start of her candidature. She articulated a number of benefits of co-authoring, including increased knowledge about how to operate in and on the discourses of publishing.

ED4: Throughout the thesis one of the things my supervisor had me doing was thinking about some of the issues coming out of my work and writing about it and trying to publish that. So it was almost like getting the work out there in the public domain so that there was critique happening throughout the thesis.

... I suppose I've been extremely lucky in that I've always had the support of my supervisor. So a lot of the help around publishing and things that are worth publishing and how you go about it and how you deal with the critique that comes back. I've really learnt from her, in that I suppose she's been like a first cut publisher anyway, because anything I've written I've usually run past her. And she's given me feedback or at least said you might want to do a bit more reading here or a bit more thinking here or put it in and see what happens and then help me deal with the critique that's come back ... In fact after my first go at writing a journal article, I probably would never have gone and done it again. I would have just thrown that one in the bin if I hadn't had that sort of assistance and feedback ...

Here the graduate connects what she has learned about publishing ('how you go about it', 'how you deal with critique') to the work of the dissertation, more broadly. 'Getting work out there in the public domain' has clear benefits for the thesis in providing a usable, public critique. The term 'first cut publisher' evokes an understanding of the supervisor as a critical mediator and representative of the broader scholarly community, embodying its conventions, reading the text to help it stand up in the international arena. Again, it is the supervisor who keeps the student in the game ('I would have just thrown that one in the bin if I hadn't had that sort of assistance and feedback'). Education graduates who did not enjoy this kind of co-authorship scaffolding failed to publish in quality, international refereed journals.

The struggles and anxieties of doctoral scholars

The publication reflections of graduates in both science and education suggest that doctoral writing and publication was a site of anxiety for all students in this study. A strong theme that ran through the interviews was the feeling that, regardless of publication success or failure, the whole process was one of tremendous effort and struggle. There were, however, qualitative differences in the kinds of anxiety expressed by graduates in science and education. Science graduates talked of the fear of being judged by other scholars, as in this reflection from a male ecology graduate, who discusses the stress of being critically reviewed.

SC2: It's you know, sort of putting yourself out there in front of your peers to be examined, not torn down, but you're being critically reviewed so yes, there is some sort of angst involved in that. Even though the thesis goes to examiners, the thesis itself tends to sit and goes to dust. This is the real public face of the thesis. This is what people judge you on because when you read it, you can generally tell if it's someone's thesis work. That's where you're first introduced to the rest of your peers. So yeah, there's that sort of anxiety there.

This account distinguishes between the thesis text – an inert object which ‘goes to dust’ – and the journal publication – ‘the real public face of the thesis’. It is the public text which he believes is judged, the place where the doctoral student’s scholarly identity and scholarship is on public display – and at risk. The fear that others may judge the work as lacking is a point also highlighted by a female graduate in Environmental Science.

I: Was there any kind of level of anxiety attached to writing for publication, for you?

SC4: So much.

I: Where does it come from?

SC4: It comes because once you put it out there, it’s out there and people can know you by it and if there’s a mistake then you know it’s quite embarrassing. I mean people do make mistakes and you can retract things but you just don’t want it to happen. And particularly when I was publishing work that I’d done myself and there are so many people who are expert in the field. I was just so afraid of making a tragic mistake. Like mislabelling something or not identifying something correctly, then being known all along as, ‘oh you know the one who ... yes, precisely’ ... You’re being judged as a professional. Whereas with your thesis I think people are often kind and more inclined to be lenient maybe, because it’s not out there.

In this account, making a ‘mistake’ is potentially ‘tragic’, because people will ‘know you by it’ and it is difficult to undo the damage once it is done. Such commentary highlights the indivisibility of the text and the scholar. Many academics fear they will be judged inadequate because their writing fails to pass muster in the eyes of their peers; such feelings are even more acute for doctoral students. But there is no suggestion here that the challenge of ‘being judged as a professional’ is to be avoided. Rather, it is a cost of the game, one that can be cushioned by the support of supervisors.

Education graduates also expressed publication-related anxiety, but their articulation focused less on the vulnerability of going public and more on a sense of personal inadequacy. Thus, even the two education graduates who produced successful co-authored publications did not appear to emerge with a strong sense of achievement or professional authority. The dominant image used by the early childhood graduate was one of struggle:

ED5: I still struggle with that idea of, you know, who am I to say anything worthy for someone else to think about anyway. But I think it’s also that sense of well, you know, there’s such a big world out there that thinks very differently to the way I’m thinking and the critique is very strong of the sort of work I’ve been trying to do. But you know I guess it’s that sense that they’ll just think it’s rubbish and it will go to the bottom of the heap anyway.

This self-critique is filled with negative generalisations, about her capacity to ‘say anything worthy’ and the quality of the work, characterized as ‘rubbish’ and designated to the ‘bottom of the heap’. Such self-deprecating generalisations were not found in the science interviews. Resignation also characterizes the following account from the mathematics/cognition graduate, who struggled through three journal rejections before her co-authored text was successfully published.

ED3: I’m a pretty confident and resilient writer. I’m happy to get feedback and rework and rework ... but if it wasn’t for [supervisor] saying those sort of things to me ... what you’ve done is really important and the examiners saying what you’ve done is really important I would probably be saying ‘oh so what, you know, I’ve done it now’ ... I guess I feel like I’m past it. I’ve given it a bit of a go and had a few knock backs and now I’ve given other things a go and I haven’t been given a knock back. They’re easier. I guess I have filled up my space now with doing other things that I like.

Such commentary suggests that education graduates may emerge from the process of doctoral publishing with less resilience and authority than their peers in science discourse communities,

possibly because their co-authoring experiences are fewer and less institutionalized as a pedagogic practice. This is not simply to idealize or overgeneralize the science discourse community, but to argue that such differences do not just happen. They are produced and should be open to question.

In this case study, the discourse communities of science and education created different pathways into writing and publishing. These pathways led to quite distinct sets of supervision experiences, and to marked differences in the ways graduates perceived themselves, their 'place' in their academic community, and the overall value of their work. Such outcomes are clearly of concern to those of us involved in supervising doctoral writers, in particular in the field of education.

Conclusion

It is not the intention of this case study to generalize to larger populations, or to essentialize 'disciplinary differences' in education and science. The data do not allow it. Rather, it has identified different patterns of supervisory support for publication through co-authorship in two discourse communities, and demonstrated different effects on the formation of doctoral scholarly identities.

The focus on discourse communities and their capacity to shape scholars is significant, and congruent with the conceptual treatment of doctoral writing as a discursive social practice and as text work/identity work. From this lens, differences in student publication output are seen to be produced in these communities. Accordingly, they can be made differently, if our collective goal is to produce doctoral graduates who are active participants in international publication and peer dialogue, which I take to be one crucial outcome of doctoral education.

While I do not want to unproblematically elevate discourses of science, or minimize the different and sometimes problematic issues associated with co-authorship, the data in this case study disrupt a current 'reluctance' in education to co-author with students. The analysis in this study has shown that co-authorship with supervisors was significant in getting a profile for student writing in both education and science. It was co-authorship that produced international refereed publication – without it, it did not occur. Co-authorship helped students move through the struggles and anxieties of publishing. It taught them how to be robust in the face of rejection and ongoing revision.

Golde and Walker (2006) argue that doctoral education programmes should be structured to prepare students as 'stewards of the discipline' – scholars who imaginatively generate new knowledge and critically conserve valuable ideas – but also transform those new understandings through writing, teaching, application, and, I would add, publication. Following McGrail, Rickard, and Jones (2006), I argue it is important to scaffold student publication and create structures in our disciplines that enable students to participate – as it is these structures that influence whether or not academics publish. If students publish in their formative years, they are more likely to do so as established academics or informed professionals in their chosen fields of practice.

A key move, in relationship to this study, would be to rethink co-authorship more explicitly as a pedagogic practice rather than as an output-driven manoeuvre to increase productivity. Emerging scholars need to be supported in more explicit, strategic and generous ways than currently happens, so that we produce more confident graduates who know how to publish in a wide variety of contexts, including international refereed journals. For education and the social sciences more broadly, there is a significant challenge in this proposition, as there appear to be few established expectations about co-authorship as an ethical practice. For the sciences, it might be useful to re-examine taken-for-granted practices around co-authorship; for example, why every student publication needs to carry the supervisor's name, when all doctoral text work is co-produced in and through the supervisory relationship.

However, it is also important to explore other pedagogical alternatives to co-authorship. Lee and Kamler (2007) discuss two strategies that deliberately use publications to take forward the work of the thesis, countering a common worry that publication during candidature will sidetrack or distract students from dissertation work. Other initiatives to foster doctoral publication outside the supervisory relationship are also rich with possibility. At my own institution, for example, I have developed a publication mentoring scheme, which aims to build capacity for early career researchers in education by fast-tracking publications from their dissertations. Researchers are supported to develop publication plans, write compelling abstracts, craft successive drafts of articles for targeted refereed journals and build textual authority and confidence. They gain practical and political know-how about journal submission through the mentoring process, as well as success in publication – not unlike the benefits science and education graduates gained from co-authoring relationships with supervisors.

Clearly, the issue of doctoral publication requires serious pedagogical attention from the higher education community. Many questions remain. What are the new possibilities for building institutional writing cultures (see Kamler and Thomson [2006] for recent Australian examples), where questions of writing and publication are linked to questions of identity and capacity building, as well as wider institutional aspirations? How do we ensure that doctoral writing and publication are not narrowly and ruthlessly connected to productivity, but rather linked to fostering research capacities and practices in a wide variety of discourse communities? Future generations of scholars depend on the answers to such questions.

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