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Learning through Writing: Reconceptualising the Research Supervision Process

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This paper seeks to re-conceptualize the research supervision relationship. The literature has tended to view doctoral study in four ways: (a) as an exercise in self-management, (b) as a research experience, (c) as training for research, or (d) as an instance of student-centred learning. Although each of these approaches has merit, they also suffer from conceptual weaknesses. This paper seeks to harness the merits, and minimize the disadvantages, by re-conceptualizing doctoral research as a "writing journey." The paper utilizes the insights of new rhetoric in linguistic theory to defend a writing-centered conception of supervised research and offers some practical strategies on how it might be put into effect.

The supervisory relationship is the key to successful higher degree research. So much appears to be the consensus of scholars. As Hasrati (2005, p. 557) notes,

> Most of the literature singles out the relationship of supervisors and students as critical influence on the completion of the doctorate. Supervision is said to be 'crucial'; 'pivotal'; 'at the heart of most research training'; 'at the core of the project'; 'the single most important variable affecting the success of the research process.'

Even those who reject the traditional one-on-one or co-supervisory models based on face-to-face meetings, such as Colbran (2004), still emphasise the importance of supervision but advocate alternative approaches to supervising students, such as a "collaborative supervision model based on an electronic community of practice" (2004, p. 1).

But what is the dynamic that should underpin the supervisory relationship? Hasrati (2005) submits that there is "lack of an analytical framework to capture the relationship between supervisors and PhD students" (p. 558) Although the literature might lack an explicit theoretical consideration of the key ingredients for a successful supervisor-student relationship, it is nevertheless possible to glean four broadly distinguishable, albeit overlapping, approaches to characterising doctoral study: as an exercise in *self-management* (Phillips & Pugh, 2000); as a *research* experience (McCormack 2004, p. 319); as *training* for research (Pearson & Brew, 2002); and as an instance of student *learning* (Hasrati, 2005). With their difference in emphases, each approach carries discrete implications for understanding the supervisory relationship.

That said, each of these characterizations can be synthesized to develop a fifth approach - the PhD as a *writing journey*. This is hardly a startling proposition. After all, doctoral study is meant to produce a high quality written thesis at the end of the candidature; it makes perfect sense, then, to give special emphasis to the writing process. But re-conceptualising higher degree research as a writing journey ties the extant threads of the literature together. This is because research students should be able to achieve (a) *competent autonomy* in the art of scholarly writing (Gurr, 2001), (b) by being inducted into the conventions of academic writing that underpin the relevant *research* culture, (c) through a process of both explicit *training*, and (d) *student-centred learning*. More importantly, it has real implications for student supervision. By reconceptualising the PhD as a writing journey, writing becomes the central element in the supervisory relationship.

This article is structured as follows. First, I review the literature on research supervision and explore the limits of the prevailing four views of doctoral study as an exercise for self-management, research, training or learning. Second, I use new discourse theory to explain why higher degree research should stress writing in the supervision relationship. Third, I discuss the practical ramifications of a writing-centred model of supervision. Specifically, I propose a "three-S framework"— strategies, spaces and support — for implementing such a model. Thus, I examine learning strategies that can help PhD students advance their writing skills; explore the spaces, such as the supervisor-student meeting as well as other collaborative learning places, where students can develop their writing skills; and consider the support PhD students need to ensure they gain proficiency in the writing relevant to their chosen discipline. Although the arguments advanced in this paper should have broad appeal to all types of PhDs, observations are limited to doctoral work in Law, the Humanities and the Social Sciences.

Existing Models of Research Supervision

The literature portrays doctoral study in four different ways. Phillips and Pugh (2000), for example,

describe it as *self-managed* education. Unlike undergraduate education where university teachers determine the syllabus, assign textbooks and set examinations, postgraduate research requires the student to exercise personal responsibility, albeit with support, for designing and carrying out their research project. As Gurr (2001) observes, the objective of supervision, therefore, is for the student to achieve competent autonomy. By contrast, McCormack (2004) regards doctoral study as a *research experience*. A PhD is about acquiring proficiency in the art of research. Therefore, McCormack argues, one of the barriers to a productive and successful doctoral experience is that institutional and student conceptions about research are often unaligned. Pearson and Brew (2002) put forward yet another, arguably more instrumental perspective, doctoral study as *training* for research. Consistent with an increasingly economic approach to government policy on higher degree research, especially in Australia (McCormack, 2004), such training is required to meet certain defined and measurable indicators of quality and efficiency, such as employment outcomes, emphasis on "explicit skills formation" (Pearson & Brew, 2002) and timely completions. Finally, Hasrati (2005) argues that a PhD as an instance of *student learning*. The PhD, Hasrati argues, has cognitive and social dimensions: in short, doctoral study is both "an individual and collective [learning] activity" (2005, p. 558).

This brief survey somewhat caricatures the literature. Bright lines do not separate these different perspectives; rather, they bleed and blur. For example, those who see higher degree research as a learning experience most commonly, although not universally (e.g., Diezmann, 2005; Hasrati, 2005), adopt the cognitive apprenticeship (Collins, Brown, & Duguid, 1989) as a model for supervision. However, this model is also consistent with those who argue that PhD students must self-manage their own projects. This is because the cognitive apprenticeship holds that conceptual and problem-solving knowledge is embedded in learners through observation, scaffolding (coaching) and, most importantly, increasingly independent practice. Competent autonomy is also one of the "outcomes" or "generic skills" expected in the "economic model" of the PhD as research training.

Even so, each of these four extant approaches to research supervision suffers from conceptual weaknesses. These weaknesses justify a re-conceptualisation of how institutions should support doctoral research. Consider, for example, the view that a PhD is about self-managed education. Phillips and Pugh (2000) use this to argue that a PhD involves the "progressive reduction of uncertainty" (p. 86). They argue that PhD students need to go through a succession of stages- from identifying the field of interest, selecting possible topics, conducting a pilot study, making a thesis proposal, collecting and analysing data and final writing up. Although they admit that "it is unrealistic to expect that [a student] would go through these stages in a straightforward line," they do assume that the "main weight of writing up" (p. 87) comes towards the end. This assumption that research and writing are separate and distinct stages, however, is not sustainable - language is not a transparent 'window' into thought; writing shapes ideas just as much as ideas determine the choice of expression. As such, writing and research are inextricably linked (Campbell, 1993; Fajans & Falk, 1993; Phelps, 1986). PhD students, therefore, should be encouraged to write "through" their candidature, rather than "write up" their research results (Nightingale, 1992).

A similar problem underlies the conception of doctoral study as a research experience. The difficulty with this model is that, once again, writing does not assume the central significance it deserves. Pearson and Brew (2002), for example, identify four conceptions of research held by senior academics: the domino conception, the layer conception, the trading conception and the journey conception. Although these four conceptions are distinguishable on structural and referential dimensions, none of the conceptions consider the place of writing in knowledge production. Thus, knowledge is generated by following a sequence of steps (domino conception), uncovering lawyers of meaning (layer conception), producing research outcomes (trading conception) or realizing new ideas in a personal journey of discovery (journey conception). Possibly, writing is seen as the last stage of research (domino conception), the product of research (trading conception) or the expression of new understandings (layer and journey conceptions). But, once again, this misconceives writing; after all, writing is not just reporting "the research"; it generates meaning in and of itself and, therefore, is part and parcel of the research enterprise.

The view of doctoral study as training for research is even more problematic. For some, a market-oriented, economic model of graduate-level research represents a sinister turn towards a loss of rigour, variety and scholarly pluralism in research. Twining (1996), for example, despairs of a "form of homogenising, authoritarian bureaucratic-rationalism" (p. 304); James (2004) deplores the ascendancy of an ideology that pushes "corporatist objectives of efficiency and profitability" (p. 149). For others, however, the training model of doctoral research falsely assumes a systematic and linear research experience. As McCormack explains (2004, p. 320),

> Research in this context is operationalized around conceptions of time that are linear: clock and

> calendar time. Policies emphasize start times, completion times, finishing in the prescribed time and completing pre-set tasks at fixed times during enrolment. Thus, research is assumed to be a linear activity with a beginning and a known and fixed end-point.

Once again, writing is seen as the product rather than part of the process. If writing were given more prominence in this model, then assumptions of postgraduate research as carefully constructed, coherent and methodical would break down. Instead, research would properly be seen as "complex, often chaotic, sometimes messy, even conflictual, full of critical moments that disrupt [the] process" (Byrne-Armstrong, 2001, p. vii). "In research as in life as in art," add Cole and Knowles (2001, p. 228), "there is no possibility of completeness, certainty or closure."

The final view of doctoral research as a learning process is also not without its problems. However, I do not want to over-state the criticism here. If anything, regarding higher degree research as an instance of learning has proved more powerful than poisonous. For example, it has opened up the supervision process to teaching and learning theory and ideas that, for long, university policy and long-standing institutional practice has kept away from its gaze (Malfroy, 2005). By tradition, higher degree students are regulated by an institution's research policy and are supervised by senior researchers; linguistically, and therefore, conceptually, teaching and learning have been eclipsed from view. Today, however, this is no longer the case (Malfroy, 2005). Even so, some pedagogical models of supervision do not find a proper place for writing. Gurr (2001), for example, criticizes a "concrete" model of supervision in which "tools and techniques serve to manage the process" (p. 82). Although the thrust of Gurr's critique is that such a model over-estimates the potential of tools to diagnose problems and eradicate misunderstandings, my criticism is that such an inflexible approach to supervision also fails to accommodate the inherently messy and recursive nature of writing which cannot be reduced to checklists, ratings or "how-to" procedures. In a similar vein, Malfry (2005) and Colbran (2004) criticize hierarchical, master-apprentice models of supervision for assuming that writing skills can be uncritically transmitted from academic experts to student novices. More typically, however, many models of supervision, such as Hasrati's (2005) view of legitimate peripheral participation, simply ignore the importance of inculcating PhD student with the skills of scholarly writing.

Towards a New Model of Research Supervision: The Writing Journey

Rationale

Given these weaknesses in existing models of supervision, I argue in favor of a new model in which writing is given central importance — where a doctorate is "written through" the candidature (Nightingale, 2002) not "written up" at the end; where writing is a process not a product; where writing is integral to meaning-making not simply a tool to expose the underlying meaning of the research. This is not to suggest that other issues relevant to the supervision relationship, such as aligning conceptions of research (McCormack, 2004; Pearson & Brew, 2002), are unimportant; however, it is my contention that most issues can, and should be, seen through a writing-based approach to supervision.

Even on current models of supervision, it makes sense to give writing due priority in the supervision relationship. After all, the award of a PhD depends entirely on a written thesis. Thus, proponents of self-managed supervision, such as Pugh and Phillips (2000), despite their view that the bulk of writing should come near the end of the candidature, presumably when the student has achieved or is close to achieving competent autonomy, still see merit in beginning the writing process early in the degree. Similarly, Caffarella and Barnett (2000), who take an instrumental view of supervision as training students for research, argue in favor of engaging candidates "in scholarly writing early in their doctoral program experience. In particular, our aim [is] to assist students develop and/or enhance the form, style, content and quality of their academic writing during the initial phase of their doctoral study" (p.142). Put bluntly, writing is a generic skill that supervisors need to develop in their research students (Colbran, 2004).

But there is a more potent theoretical reason for giving writing proper weight in the supervision relationship. As recent developments in linguistic theory have established, writing and research, or language and meaning, are inextricably linked. Traditional views of writing assume that,

> Competent writers know what they are going to say before they begin to write; thus, their most important task when they are preparing to write is finding a form into which to organize their content. They also believe that the composing process is linear, that it proceeds systematically from prewriting to writing to rewriting. Finally, they believe that teaching editing is teaching writing (Campbell, 1993, p.663).

Phelps (1986) has criticized traditional approaches to teaching writing as focusing too heavily on obtaining an error-free product and the ABCs (accuracy, brevity and clarity) of writing. She argues that most writing rules are actually rules for revision that do not help students understand the writing process or to write more effectively. Phelps argues that the concepts of new rhetoric, which emphasis the process of writing rather than the product, should be applied (Campbell, 1993, p. 664),

> New rhetoricians believe that we are constantly searching for knowledge, and that discourse is the means of both learning and shaping knowledge. Thus, writing is the making of meaning, ... the expression of human intelligence and imagination, not merely a convenient packaging of preconceived thought, and certainly not a mere social grace or job skill.
>
> New rhetoricians thus believe that writers discover what they want to say as they are writing, and that the writing process is recursive rather than linear. For example, it is only through writing that gaps in the analysis come to light which in turn require additional research. Although writing may be divided into stages for purpose of description, these stages overlap in practice.

The core lesson of new rhetoric theory, then, is that research, writing and argument are linked, not severable, processes. Language creates meaning. "As such language neither mirrors nor reveals truth; it defines or makes truth possible" (Fajans & Falk, 1993, p. 174).

At this juncture, it is worthwhile to address briefly some potential criticisms of a writing-centred conception of research. Some postmodern scholars, for example, have strongly attacked the "writtenness" of research; that is, the assumption that research texts are somehow neutral, objective and realistic depictions of lived experiences (e.g., Cole & Knowles, 2001; de Freitas, 2007; Lather, 1991; Maclure, 2003). However, their objections lie in the narrative conventions structuring and shaping research writing rather than in the lessons of new rhetoric theory. If anything, their agenda for "disrupting and interrupting" the process by which readers tend to uncritically accept the foundational truth of research narratives (de Feitas, 2007) seems to accept the centrality of writing in the research process.

Pedagogy

So what type of pedagogy can support this new writing-centred approach to doctoral education? One of the most popular pedagogical models in higher education theory is cognitive apprenticeship (Diezmann, 2005; Hasrati, 2005). According to Brown, Collins and Duguid (1989), a cognitive apprenticeship is where conceptual and problem-solving knowledge are embedded in learners through observation, scaffolding (coaching) and increasingly independent practice. Teachers need to redesign learning environments — content taught, pedagogical methods employed, sequencing of learning activities and the sociology of teaching — to effect a transition to cognitive apprenticeships. This is tied to overcoming surface learning through which conceptual and problem-solving knowledge remains largely unintegrated and inert for many students. Cognitive apprenticeships involves (a) teaching processes that experts use to handle tasks, where knowledge is exemplified and situated in the context of their use by setting up a conceptual model of how a task such as reading is performed; (b) learning though guided experiences in which tacit cognitive and meta-cognitive processes that comprise expertise are brought into the open where students can observe, enact and practice them with the help from the teacher and other students; and (c) development of self-monitoring and self-correction skills through reflection (alternation between expert and novice performances and abstracted replay) and producer-critic dialogue (discussions, group problem-solving and alternation of teacher and learner roles).

The cognitive apprenticeship model provides a suitable framework for a writing-centred approach to supervision because supervisors can model, coach and support, through feedback, the academic writing skills of their students. This upfront support, or scaffolding, can fade over time as students achieve greater proficiency with their writing; supervision can then move to periodic reviews of chapter drafts. The cognitive apprenticeship model, however, is not without its critics. Colbran (2004), Diezmann (2005) and Hasrati (2005), for example, offer three lines of criticism. First, the model is fallacious to assume that supervisors are necessarily scholarly writers, proficient in academic writing or write regularly themselves. Second, the cognitive apprenticeship model can break down if students assume a passive role with respect to improving their writing. Third, students can learn about the conventions of scholarly writing in collaborative and informal learning environments outside the formal one-on-one meeting, such as in electronic communities of practice (Colban, 2004) or as part of informal information-sharing exchanges with their peers (Diezmann, 2005; Hasrati, 2005).

These criticisms, in my view, are not entirely fair. While supervisors may not be expert writers, this is more a problem with supervisor selection rather than

pedagogical model. Further, the cognitive apprenticeship assumes an active task-based learning environment where students are expected to practise skills that their supervisors model and support. If students are "passive" about improving their writing, this is attributable to problems implementing the cognitive apprenticeship model rather than with any defect in the model itself. Finally, the cognitive apprenticeship does not foreclose the possibility of alternative and collaborative learning spaces beyond the one-on-one meeting. For these reasons, I re-assert confidence in the cognitive apprenticeship as a model of research supervision.

The Three-S Framework: Strategies, Spaces, and Support

I now move to outline my reflections on how the cognitive apprenticeship may be operationalized to prioritize the place of writing. The three-S framework — strategies, spaces, and support — furnishes a structure for my reflections. Specifically, I first examine the types of learning strategies that may diagnose and develop writing skills; second, I turn to the spaces, not only the supervision meeting but also collaborative learning contexts such as electronic communities of practice, group meetings and workshops in which such strategies would be most effective; and third I collect together some ideas on how to give constructive support (feedback) to students on their ongoing writing project.

Strategies

There are many strategies that may usefully be employed to support student writing in the doctoral program. Consistently with the cognitive apprenticeship model, the early part of the candidature can focus on shorter, more regular pieces of writing that roughly track the first few stages of the research project, identification of topic or problem, initial literature review, statement of methodology, and ontological assumptions. Since planning is very important in the early part of the thesis, early pieces of writing need not be perfect prose; they can be mind-maps, charts, tables, notes and brainstorming free-writing. For instance, students can be encouraged to submit a timetable plotting the stages and timeframe for completing the thesis, a mind-map to identify the trends and tensions in the literature, free-form emails about difficulties they are experiencing in reconciling different theoretical perspectives, and charts or tables comparing the different quantitative and qualitative methods available for the empirical part of the project (if relevant) and identifying the strengths and shortcomings of each for the project.

Writing tasks can also be set to encourage consistent and critical reading, especially during the literature review of the project. Fajans and Falk (1993), for example, have developed an innovative writing project of "talking back at the texts." This is where students do more than paraphrase or take notes of the literature, but write reflective pieces setting out their reactions to the readings. These reactions may be to identify methodological problems, hidden assumptions in the logical development of the argument, or differences of opinion based on their own experiences, values or ontological assumptions. Learning is best done by example, so to get students started on developing the skills of reflective writing, they should be encouraged to read examples of literature reviews in books, articles or completed theses in similar fields as their own research area to identify and emulate the techniques that other authors have used. This strategy of "talking back at the text" is especially useful for getting students accustomed to the culture of critical and argumentative writing in the arts, humanities and social sciences traditions.

Writing tasks can also help diagnose problems in student writing. According to Diezmann (2005), writing problems may emerge in four respects: in terms of the "culture" of critical and argumentative writing; the macro-structure of developing a coherent argument and making proper links between chapters and sections in the thesis; the micro-structure of preparing and editing persuasive prose; and, the ethics of writing (such as plagiarism, shared authorship of published pieces and copyright). Given that each student is going to present with different issues, Diezmann devises two strategies to diagnose problems with student writing:

- The first is to utilize stories as a means of reflecting on practice. Students, for example, should be encouraged to write about their difficulties, frustrations and assumptions about writing. The supervisor can then discuss these ideas with the student, sharing his/her own stories about the travails of preparing a research publication. The purpose of such a strategy is not to comment on whether one approach is right or wrong, but to expand the range of coping skills the student has at his/her disposal when confronting difficulties with writing.

- The second strategy is to "read" issues at three levels to facilitate insight into the issues. "A 'quick reading' provides a holistic impression of the issue; 'zooming in' provides a close reading of a particular aspect of the issue; and 'zooming out' contextualises the issue" (Diezmann, 2005, pp. 446-447). This three-level technique arms the supervisor with a way of reviewing student work to

> identify the learning needs of that particular student. Diezmann goes on to illustrate this approach by profiling different types of students as dependent writers, confident writers, resistant writers and sporadic writers and explaining what type of support each type of student might need.

From this information, the supervisor may adopt specific strategies to assist the student. Concerns about the ethics of writing, for example, should be considered in a meeting in which university rules on plagiarism, ethical research and copyright protection are shared and discussed, including agreeing on whether the student is prepared to jointly author papers with his/her supervisor. Problems with macro-structure can be dealt with by getting students to read examples of completed theses, or books that have developed from theses. A supervision meeting can discuss conventions in the research community for organizing an argument. Kane's (1988) book on style has an excellent guide on developing and linking paragraphs, including techniques for ensuring the flow of an argument such as repeating key words, using logical connectors, applying similar sentence patterns and setting up a master plan. To ensure students can put these ideas into practice, students can be asked to write a reflective piece explaining how an author succeeded in structuring his or her theses/book by reference to these conventions and Kane's techniques. For students who struggle with macro-structure, they can be asked to submit a side-note explaining the structure and flow of any drafts they submit further in their candidature; this can serve as a basis for diagnosing ongoing problems and suggesting work-around solutions which students can apply in subsequent drafts.

There are particular strategies for dealing with students who struggle with micro-structure, that is, clear and cogent writing style. Usually, this is because students have not developed self-editing skills. In an excellent paper, Murie (1997) offers the following advice on how supervisors can use the meeting effectively to place the student at the centre of the editing process and, thereby, develop their self-editing skills (p. 66):

> One of the most effective ways of putting the writer at the centre of the editing process is to work alongside him in answering questions and going over a piece of writing. For those of us who have the time to conference individually or in small groups with our students, this can be very effective. In its ideal form, conferencing allows the teacher to follow the writer and to note where his confusions and strengths lie. There are several advantages to this approach: it is easier to see where explanations might be useful and whether these explanations are making any sense; it builds rapport; if offered over time, it is an excellent way to help a writer develop stronger editing skills.

To extract maximum effect of these editing meetings, Murie recommends that students are given the pencil and edit their own work and, also, are encouraged to look for patterns of errors or stylistic flaws. I would go further than Murie and recommend specific editing techniques to overcome these patterns of errors. In this context, Kane's (1988) style manual is a superb resource to recommend to students, since it catalogues a range of thoughtful editing skills to invest persuasive writing with more rhythm, coherence, concision and variety. Therefore, once students identify flaws with their own writing, they can then be challenged to identify, and then apply, an editing technique from Kane's style guide that can improve the overall impact of the writing.

Spaces

The one-on-one student-supervisor meeting is often regarded as the key learning environment for doctoral students. As such, it is crucial to analyse how meetings should be effectively conducted to maximise student learning, especially when it comes to encouraging and supporting student writing. The first is to align expectations about the role writing plays in research. As McCormack (2004) observes, "successful postgraduate research has been often associated with strategies to help both students and their supervisors to clarify their expectations early in their candidature, and then to continue to check for understanding throughout their candidature" (p. 328). Numerous tick-a-box tools, such as the Role Perception Scale, have been developed to ensure this alignment. Just as McCormack (2004) argues that these tools should be adapted to include specific questions about conceptions of research, I would suggest that additional questions should be developed to identify students' attitudes to writing, for example, is writing part-and-parcel of the doctoral research or is thesis-writing the final stage once all research is conducted? Answers to such questions can provide a useful springboard for sharing with the student insights from new rhetoric theory about the integrated role of writing in generating meaning, ideas and arguments.

Gurr (2001), however, is a critic of tool-based managed supervision. Instead, he advocates a *negotiated process* model of supervision that is more responsive to the learning needs of research students. This model certainly makes more sense in light of the cognitive apprenticeship model of supervision, because it situates the students at the centre of the learning experience. In addition to negotiating with the student

management issues, such as arranging meetings, preparing for and participating in meetings, responding to feedback or requests for written work and university rules on PhD study, supervisors should also negotiate with their students when to submit drafts and other writing tasks and how and when feedback on these writing tasks should be shared. For example, consistently with the cognitive apprenticeship model, more regular meetings might need to be held early on in the candidature, requiring regular submission of smaller pieces of writing for prompt feedback; this can fade away to periodic submissions of completed chapter drafts. Supervisors can keep the students' written work, including their own annotated feedback on it, in their Supervisor's Portfolio so that they can reach an informed decision as to whether progress is sufficient to re-negotiate this part of the relationship.

Making writing central to the supervision experience can also be helpful in planning for timely completion. Writing need not be discursive writing about the thesis; it can also feature free-writing, mind-maps and charts to plot the direction of the research and the stages through which the student should be expected to traverse. For example, early in their candidature, students can draft a scoping report on how they intend to keep their research program manageable. While preparing their literature review, students can submit a mind-map or a reflective piece explaining some of the trends they have identified in the course of reading the available literature. If students become distracted, "lost" in peripheral reading or discouraged with their progress, students can write down their experiences in a freely-written email, brainstorming ideas on how to re-organise their priorities or escape their current funk.

However, as Colban (2004), Hasrati (2005), and Malfroy (2005) point out, supervision need no be restricted to the supervision meeting. Indeed, there is a compelling need for "a broader conceptualisation of doctoral education, and in particular the importance of collaborative knowledge sharing environments and collective models of supervision" (Malfroy, 2005, p. 177). Hasrati (2005) notes that students learn just as much from informal collaborations with their peers or other academics within the faculty as they do from meeting with their supervisors. This "legitimate peripheral participation" adds a social dimension to the learning experience, a welcome addition for many students since doctoral study can often be a lonely and isolating experience. The one-on-one supervision meeting can be supplemented with electronic communities of practice (Calban, 2004). This can be through email distribution lists or password protection websites, where students can use online chat and discussion tools to share drafts and comment on each other's work. Cafferell and Barnett (2000) advocate formal course work early in the doctoral program in which students can share with their peers draft pieces of work and then engage in critical feedback and critique with one another. Cafferella and Barnett argue that this form of collaborative learning helps students develop confidence in persuasive writing and sharpens their ability to explain and defend their ideas. Even without formal course work, a supervisor with many research students can convene group meetings to encourage peer interaction and support. Alternatively, more informal writing workshops may be convened for all students in the department. Co-supervisory arrangements, or even the occasional meeting with another expert in a related area of research, can also broaden the students' support network and provide new ideas and input on the progress of their research. Finally, students can present their work-in-progress to departmental research meetings or postgraduate student conferences to enhance their skills in writing, presenting and defending their ideas.

Support

Finally, feedback is important to support student writing during the higher research degree. Feedback is one of the central components of the cognitive apprenticeship, since it is the tool by which students can diagnose shortcomings in their learning as part of their journey to competent autonomy. Consistently with the cognitive apprenticeship model, it needs to be more regular, detailed and targeted in the early stages of the candidature, focusing on the students' strengths and weaknesses so that students can prioritise tasks that will help them improve their writing. As students become more proficient, or at least empowered to diagnose themselves their own problems and identify solutions, this feedback can away to general monitoring of thesis drafts.

Cafferella and Barnett (2000) note that the literature is largely silent on how to give and receive feedback. The only consensus is that research students need and want feedback. At the same time, Cafferella and Barnett observe that feedback can be an emotional experience for students on the receiving end. As such, feedback typically needs to nurture the student, identifying the positive features of the work and providing constructive advice on how to improve areas of weakness. In a management seminar, I learnt that the most effective way to give oral feedback is by way of a "feedback sandwich," that is, sandwiching critical comments within positive statements. The essential part of the feedback sandwich is to avoid contrasting connections — "but", "however", "even so", "nevertheless" — between the positive and negative comments, since recipients of feedback may take these words as a cue that the critical comments are the "real" feedback and anything else is simply "dressing." Not

only can this sustain negative emotions, it can also lead students to downplay the real strengths they bring to the research project. The feedback sandwich is an effective tool to ensure that feedback is direct and honest without crippling the confidence of students, especially in the early stages of their candidature.

Cafferlla and Barnett (2000) also report that research students can feel "frustrated" with feedback, especially if it conflicts with advice from other sources (e.g., other supervisors, their peers or from workshop/conference participants). I think there are to ways to overcome this problem. First, feedback should be carefully structured, so that the suggestions and advice connect from one feedback session to another. One of the central lessons in constructivist learning theory is that students learn as they can make increasingly sophisticated connections, thereby deepening their own understanding. In the same way, feedback is a learning tool to advance students' understanding of their own research and writing skills; therefore, feedback needs to be *connected* and *related* with previous or other feedback so that students can gain maximum learning benefit from it. Second, as Murie (1997) argues, feedback should involve the student as much as possible. Cafferella and Barnett (2000) report on an experiment where research students peer review each other's work; but a far more potent possibility is Murie's suggestions about "putting the pen in the student's hand"- that is, as far as possible encouraging the student to comment in his or her own work- which makes feedback a more student-centred learning experience and, therefore, more valuable.

Conclusion

This article has argued in favor of a model of research supervision in which writing takes pride of place in the learning process. Although there are practical and strategic reasons for getting students to "write early and often," the more important rationale is that writing is an act of meaning-making; therefore, a thesis needs to be "written through" the entire candidature, not "written up" at the end.

The article then submitted that the best pedagogical model to give effect to this model of supervision is the cognitive apprenticeship, in which students are provided with initial coaching, mentoring and scaffolding to equip them with the cognitive skills necessary for research before this fades away as the student achieves competent autonomy. It then developed a three-S framework to operationalize this cognitive apprenticeship: learning *strategies* to foster writing skills; learning *spaces* (including the meeting as well as other collaborative learning environments) where these strategies can be implemented; and learning *support* (or feedback) that is needed to embed in students the relevant writing skills.

A writing-centred conception of doctoral study is not without its challenges. Given the inherent messiness of writing (Cole and Knowles, 2001), the research supervision process can no longer be accepted as a logical, linear, step-by-step progression through clearly delineated stages towards the production of a doctoral thesis. But given the consensus that this has always been an idealization, if not an outright myth, about the reality of doctoral research, a writing journey might pave the way for a new way of conceiving the process by which students achieve deeper and sharper understandings of their research question.

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