

# ‘Designing in’ Interaction in Pedagogy: Collaborative Team Supervision and Mid-career Doctoral Candidates in Australia

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## Abstract

*Team supervision has become accepted practice in supervision of doctoral candidates in Australia, though there is broad interpretation of what might be understood as ‘team’. In some instances team means little more than a principal supervisor and a ‘name only’ co-supervisor. In other instances the team is a fully collaborative of two or more supervisors working with the doctoral student. Remarkably little research has been conducted into the way team supervision actually works, and the impact on teaching and learning for the stakeholders. While initially this research project has been directed at understanding how mid-career doctoral candidate’s bodies of industrial knowledge, experience and culture might affect the power dynamics that are fundamental to team work, more needs to be understood about the phenomenon generally.*

*Mid-career doctoral candidates are uniquely positioned, bringing with them substantial bodies of knowledge that may increase balance in power dynamics that are more typically asymmetric, and sharing knowledge sets with supervisors in collaborative supervisory arrangements. This paper lays the ground work for a qualitative study into this under theorized aspect of doctoral studies.*

## 1. Introduction

After a long and diverse career in education that spans contexts in primary and secondary education in Australia, and in a bilingual kindergarten, primary, secondary and tertiary sectors in China that included private and corporate training, I remain intrigued with concepts of learning. The diversity of my experience has given me the opportunity to consider many pedagogic approaches in different fields and in different contexts. What works best for learners and teachers, when, where and why, and what underlying epistemology drives the choices that are made by teachers remains a fascinating subject for me. The question that drives my investigation is how to get the best possible outcomes for all stakeholders.

The extended duration and personalized relationships between candidates and their supervisors in doctoral studies in Australia is largely unscrutinized. The protracted nature of these

relationships creates an opportunity to examine significant transformational learning. Mid-career professionals (40 – 50 years of age) bring with them a substantial body of industry based knowledge that often informs their topic choice and methodology [1], and may exceed the contextual knowledge of their supervisor, making this relationship fundamentally different to those who proceed to doctoral studies pre or early career [2]. Supervisors have extensive academic knowledge and access to the wider academic community required by the novice researcher as they develop their thesis. These differing skill sets potentially create a more equitably balanced learning environment, creating opportunities for expanded learning for all stakeholders.

This study seeks to reframe the role of supervisor as a learner as well as a master of knowledge, and the student as simultaneously a learner and master of knowledge. It seeks to examine the “double hermeneutic [and] dialectical relationship”[3] (p. 55) that creates expanded knowledge for the student and supervisor, and contributes new knowledge and/or specialized knowledge to a field of practice. Socio-cultural understandings of learning have identified that learning is leveraged through interaction. By intentional design that also leaves room for flexibility, interaction within collaborative team supervision may be structured to exploit and optimize mutual learning opportunities, and improve research outcomes.

## 2. Focus of the study

This study is focused on identifying how collaborative team supervision of mid-career doctoral candidates can be designed to optimize the learning outcomes for stakeholders and how the quality of the interaction might be affected by professional knowledge, life experience and cultural background of mid-career candidates.

## 3. Body of knowledge

This section will firstly address the current context of doctoral studies in Australia, and the

evolution of 'team' supervision as good practice, then examine issues related to the supervision of mid-career candidates and pedagogic models of collaborative team supervision. Finally issues of supervisor pedagogy and power dynamics will be discussed.

### 3.1. Australian context

In Australia between 2000 and 2012, the number of doctoral candidates has doubled, with increasing representation of mid-career professionals. This massification of higher degree studies has not been matched by increases in academic appointments. During the same period government funding models have changed, with funding determined by completion not enrolment numbers. The government focus has been to direct higher education to contributing to national economic development through up-skilling of human resources as a means of improving national competitiveness in a global marketplace. Program evaluation and learning outcomes are seen in neo-liberal economic terms.

These factors have had a number of impacts on candidates and supervisors. Candidates are increasingly being selected according to their capacity to complete within prescribed time limits, with unofficial preference for full-time candidates. Additionally, international candidates are avoided because of the perception that they require additional supervisory support. Candidate selectivity is more evident in engineering and sciences, especially at large and more established universities. The impact of candidate selectivity is most likely to impact on those "who are slightly older, female and studying in professional disciplines" [4] (p. 471). Increasingly universities are introducing course work, especially in professional doctorates to scaffold learning and expedite thesis development. Candidates benefit from this measure by explicit inclusion in a community of practice which also plays an important role in self learning and identity development.

For supervisors, increasing numbers of supervisees and legal concerns have contributed to an increase in co-supervision, and supervision of groups of candidates. Accountability on outcomes has added pressure on supervisor pedagogy, with more managerial styles being adopted. Domains of knowledge, while on the one hand have become more specialized and on the other more cross-disciplinary, meaning co-supervision is increasingly cross-faculty. As research has moved increasingly into industry, and away from universities, co-supervision is more frequently between academics and industry experts. Pressure to change pedagogy to adapt to increasing and increasingly diverse candidate cohorts who are expected to complete their thesis in the minimum time with the minimum use of resources has directed supervisor learning to refining

their craft and/or finding ways around the system [5]. In this context team supervision has come to be regarded as best practice, providing greater accountability and ensuring legal obligations to research students are met. The emergence of team supervision, apparent in the literature on doctoral pedagogy, also responds in part to calls for more collaborative and supportive pedagogies but does not necessarily challenge the assumption of independent scholarship abilities of mid-career students.

### 3.2. Team supervision

In the literature the term 'team' supervision is contested. Manthunga [6] defines team supervision as "the supervision of one research higher degree (RDH) student by two or more supervisors" (p. 42). She makes team supervision distinct from the sole supervision of a research student by one supervisor, the more traditional model in the social sciences. Manthunga's study of policy documents relating to team supervision reveals the primary/co-supervision configuration, and the various roles and positioning of the two parties. This type of policy is evident also at La Trobe University, where the Supervision of Research students Policy defines the rights and responsibilities of supervision. It is clearly stated that:

All candidates must have a principal supervisor who is a staff member and is on the Register of Supervisors, has the qualifications and experience that enables them to direct the work of the candidate and ensure the candidate meets all administrative and academic requirements. The principal supervisor will provide training in the planning and execution of research, be accessible in person to the candidate at mutually agreed times and should make contact on average once per fortnight and not less than once a month. The supervisors must ensure that the candidate is making satisfactory academic progress and where applicable suggesting ways of addressing problems.

Candidates must also have a co-supervisor and may also have an external co-supervisor or associate supervisor who provides additional input and direction to the research. Co supervisors are members of staff of the University where external co-supervisors or associate supervisors are not members of staff of the University [7].

In this statement it is clear that the principal supervisor takes primary responsibility for the student and their thesis development, while the co-supervisor or associate supervisor 'provides additional input and direction'. The co-supervisor may be a potential stand-in if the primary supervisor becomes unavailable for some reason. In this case

the co-supervisor needs to have an overview of the project but only becomes active if the need arises.

Nulty, Kiley and Meyers [8] in their examination of excellence in supervisor practices, discuss a range of supervisory arrangements, including supervision of less experienced supervisors by experienced supervisors. In this circumstance, it is possible that the student will not actively engage with the senior supervisor because the senior supervisor's role is principally to advise the primary supervisor. While this may be considered a 'team' there is limited, if any, collaboration with the student. At the other end of the spectrum are supervisors who are all actively involved in a collaborative manner, who meet as a team with the student as often as practicable and perhaps providing different perspectives. Guerin, Green & Bastalich [9] take a different view, defining team supervision as "two or more supervisors sharing responsibility for a PhD candidates progress (p. 137). Pole [10], in reference to extensive research in the UK uses the term "joint supervision", observing that in the social sciences this usually involves two supervisors and on rare occasions three supervisors. The supervisors all actively collaborate in supervising the doctoral students, with individual roles that are defined by the nature of the research and the student's needs. Lee [11] does not provide a definition of 'team' but her work is based on the assumption that a team has a principal and secondary or co-supervisor/s and or associate supervisors who are actively involved in the supervision of the doctoral student, and may also include advisers who have specific skills or knowledge to contribute to the project. Sinclair [12] discusses the merits of a 'hands on' approach of the Natural Sciences that are essentially collaborative teams supplemented by additional interactions with the wider academic community. He observes in 2004 that this approach is relatively new and uncommon in the social sciences and supervisory pedagogies in social sciences may benefit from the more collaborative approaches of natural sciences. No clear definition of team is provided and it is unclear if the intention is for collaborative teams of supervision or for collaborative approaches that include interaction with the wider academic community or both. For the purposes of this study the term 'collaborative team supervision' will be used to define a team as two or more supervisors who work actively in collaboration with the student throughout the period of doctoral study.

### 3.3. Mid-career candidates

In a climate of deep conceptual and structural changes in higher education in Australia, supervision of doctoral candidates is increasingly under pressure. Zeegers and Barron [13] argue strongly that "traditional approaches to supervision do not

position students as having much influence in shaping the learning process" (p. 26). With extensive professional knowledge backgrounds, mid-career candidates may expect to have input into the shaping of their learning process. The hierarchy of knowledge presumed in traditional pedagogies, is being challenged by diversity of candidates and pressured by knowledgeable candidates.

Morley [2] argues that issues raised by candidature of this increasing cohort are different to those who follow the more traditional path through Honor's and Master's courses at the outset of their careers. The emergence of Professional Doctorates opened up increased opportunities for mid-career professionals to return to study. Morley points out a number of differences in supervising PhD and Professional Doctorate students. Generally Professional Doctorate students are older, and to be accepted into the doctoral program they need to have professional qualifications and substantial professional experience. Professional Doctorate students have "maturity, practical judgment and knowledge [that] needs to be respected" (p. 117). These students, drawing on their professional experience are prepared to challenge academic theories, are confident of their professional expertise but are concerned about meeting academic standards. Academic writing can prove a challenge as there is a degree of 'unlearning' as the students are accustomed to writing for a different audience. Professional doctorates are supported by course work that scaffolds their academic development, providing collaborative interaction with other students and academics. Morley places great emphasis on comprehensive planning at the outset of the study, including project management planning and discussing the nature of the relationship between supervisor and student. He concludes that the dynamics of supervision of mature professional doctorate students are different, and consideration of this difference needed to be reflected in workload evaluation. The supervision model discussed by Morley is based on a single supervisor with collegial support.

Berman and Smythe [14] state that many of their professional students have come to doctoral study with "ideas which are best described as 'theorising from practice'" (p.7). Ryan [1], in her collections of reflections of mid to later-career students acknowledge that they bring with them a substantial professional body of knowledge and life experience which contributes to their research and thesis. Their learning is largely self-directed towards the production of a thesis, facilitated by supervisors, university and in some cases industry infrastructure, with curriculum focused on the development of research and production skills. This would suggest that mid-career candidates exercise considerable

agency in returning to study with an agenda formed by their prior knowledge and experience.

The collection of reflections in Ryan [1] reveals the connection between professional background with topic, and methodology selection. A number of reflections (12, 15 and 16) are from candidates with teaching backgrounds who chose topics within education directly related to their work. One chose auto-ethnography in qualitative methodology, the other used narrative and auto-ethnography, described as pedagogy for artistry. Reflection 13 was written by a former public servant who examined disenfranchised public servants, telling the stories of perceptions of work, suffering and injustice. Reflection 14 was by a palliative care nurse who completed her thesis on palliative care nursing in rural areas and trends in aging. She chose mixed methods, as she not only wanted to tell the stories, but provide statistical data that could be used within the industry. However, Neumann [3] suggests that whilst topics may derive from a candidate's employment, there appeared to be a "lack of close involvement with industry or profession" (p. 217). The doctoral journey is often a lonely one and of limited interest to others at work, home or socially. The deeply personal nature of doctoral studies creates tensions between existing work and life networks, making support from supervisors and communities of practice crucially important.

### 3.4. Collaborative arrangements of supervision

Interdisciplinary, multidisciplinary and trans-disciplinary arrangements have become increasingly common as domains of knowledge cross traditional boundaries. Team supervision that introduces additional stakeholders (and therefore interactions) into the activity needs careful management to achieve the potentially great benefits. Manathunga, Lant and Mellick [15], in response to these developments (complexity and configurations) lay the groundwork for the development of pedagogy, a task still in developmental stages, especially in social sciences and humanities disciplines. Their study involved an interdisciplinary, collaborative teaching team. They suggest that there are four major dimensions that need to be considered in pedagogies for these configurations:

...relational, mediated, transformative and situated learning experiences; opportunities to develop intercultural knowledge and skills; learning activities that enhance students' higher order thinking and metacognitive skills; and research tasks that build upon students' epistemological understandings of disciplines and interdisciplinary knowledge (pp. 376-7).

These four dimensions stress critical, reflective thinking, conceptual frameworks, intercultural learning and contextual, interactive learning experiences.

Nisselle and Duncan [16] in examining multidisciplinary supervision with multiple supervisors working collaboratively as a team discuss both the strengths and challenges of this configuration of supervision. Different disciplines have varying traditions and protocols that surround thesis production. There are the practical considerations of administration, enrolment, management, scheduling, and location of meetings. Academic issues such as writing and presentation styles, data gathering, research dissemination, formatting and the acknowledgement of original contribution, and markers' discipline need to be addressed. Epistemological concerns such as the purpose of the research, disciplinary interpretation of academic rigor and supervisory styles can be problematic. In the challenges raised by Nisselle and Duncan, the issue of pedagogy is implicit. How the doctoral student is taught, the educational theories and values, evidence, justification, and the skills to inform the translation of this arrangement into practice requires the development of common ground between multiple disciplines. Candidates are exposed to an increased number of interactions with sometimes contradictory advice. Learning to navigate and make sense of differing advice and perspectives, and managing the power that underlies them may create opportunities for greater learning.

Multidisciplinary research differs from trans-disciplinary in that in the former the candidate opts to favor one discipline. Trans-disciplinary research blurs disciplinary boundaries by the development of "epistemological pluralism" [17] (p. 129). This work discusses the complexities of supervision from both candidate and supervisor perspectives and it is by inference rather than clear statement that supervisors form a collaborative team. The complexities of research that creates spaces between and outside disciplinary boundaries also creates complex challenges for supervisors and candidates, requiring collaboration from industry or community outside the academic world. Willetts et al.'s [17] heuristic work is presented explicitly as a contribution to the development of a pedagogy that will underpin these configurations of doctoral research. In similar ways to Nisselle and Duncan [16], the negotiation of complex interactions exposes students to many opportunities. The challenge is to make sense of disparate, conflicting information and managing these complex interactions.

Pang [18], in a short, poignant account of his student experience of collaborative team supervision, makes a number of significant points. As a mid-career international student, the level of difficulty was significantly greater as he grappled with

language, isolation and cultural difference. Pang recounts that he selected the university according to his research topic and prepared himself well by working hard on his English and attended Master's courses at his home university with the dual purpose of updating his topic pertinent knowledge, literature in the field and language skills through interaction with English speakers. Once enrolled, the department head advised three supervisors according to expertise in aspects of the topic. Initially reluctant because of fears of conflict and confusion that multiple perspectives might create, the need for expert advice was seen as the greater issue. Describing collaborative team supervision as an "organic process" (p.159), Pang attributes the successful outcomes to all four participants. He enumerates five key factors to the success. Firstly a good start where mutual expectations were established, meeting formats and composition detailed, and work-in-progress submission protocols and schedules discussed. Most importantly, Pang was frank about his concerns about team supervision and these were discussed openly. Secondly, trust and respect between all participants were very important. The diverse perspectives were all considered by Pang, and he made the decisions himself if compromise could not be reached. Avoiding the politics that are inevitable within organisations was the third factor. Pang and his supervisors saw no place for his involvement in department politics. Pang also kept a clear distinction between the social aspects of occasional non-work interaction with his supervisors, and the work of his thesis. The fifth factor was to be sensible, reasonable and supportive. Pang was appreciative of the support and consideration shown him by his supervisors, which enabled him to interact freely with team members. Pang supported his thesis development by extensive reading, taking the advice from his supervisory team seriously, exposing himself to public comment by writing and presenting papers at conferences, and in forums provided by the university. Throughout Pang's account is a clear sense that he saw himself as being in control of his study and thesis, and he approached the undertaking with maturity and confidence.

With the increased complexity of interactions in collaborative team supervision in any arrangement, the management of this complexity is a key to optimal learning outcomes for students. For candidates who have maturity and confidence to be active within the collaboration and are able to make sense of different and sometimes contradictory advice and negotiate from an empowered position are likely to thrive within these arrangements.

### 3.5. Pedagogy and power

Johnson, Lee and Green [19] argue that there is a paradox of constraint and freedom in doctoral

studies. Fundamental to many models of pedagogy in doctoral studies is an assumption of the independent scholar. According to Johnson, Lee & Green, the modern, pastoral or 'invisible' pedagogy of supervision engages in a pretense that students autonomously produce 'their own thesis', in regulated freedom. Supervision implies the overseeing of a student's thesis development, a position of significant power. Using Bernstein's thesis, Johnson, Lee and Green argue that within this paradox agency may be developed. Agency, or the ability to empower oneself, is a key factor not only of completion, but of identity transformation.

Identity and transformation of identity is a frequent theme throughout the literature on doctoral candidates. Cotterall [20] argues strongly that identity plays a key role in agency that is enabled and enables through transitions and transformations. Identity is "socially and discursively constructed, fragmented and plural", has the capacity to create "the potential for conflict between the identities individuals claim for themselves and those assigned by others, as well as between the identities individuals perform in different settings" (p. 2). For doctoral students identity is a transformation of who they are, and the projected identity of whom and what they are becoming. However, similar to viewing doctoral students as being already autonomous, Barnacle and Mewburn [21] challenge the conventional notion of agency as autonomous, rather seeing it as the result of interactions within networks of actors. This would also suggest that interaction within a collaborative team arrangement of supervision would have significant impact on the development of identity and student agency, and underline the importance of student involvement in communities of practice.

This interactive dynamic according to Manathunga, Lant and Mellick [15] places power as an integral component. Manathunga et al frame their discussion of doctoral pedagogy on "cultural studies understandings that regard pedagogy as the active, productive power relations between the student, the teacher (or supervisor) and knowledge" (p.366). This is an interactive dynamic that engages the candidate with research material, supervisors and other stakeholders at the heart of doctoral studies. In later work, Manathunga [6] argues persuasively that the power dynamics in team supervision, an increasingly common form of supervision, reveal tensions in the interrelationships of co-supervisors and students. Within the various identities of student and supervisor these agenda, often unrecognized consciously, play out as emotions with needs met or unmet. In the overlapping and entangled layers of power lies agency as "neither supervisor nor student can escape the workings of power because it is the productive ground of supervision, it makes things happen, indeed it makes supervision what it is" [22]

(p. 188). In collaborative team supervision the increased interaction potentially adds to production or learning outcomes, but also to the risks for all stakeholders.

This issue is at the heart of Manathunga's [6] revealing examination of team supervision genealogy. She points out that the university policy documents make a critically flawed assumption that "relations between supervisors are assumed to be free of power dynamic, personality clashes, intellectual or personal jealousies and so on" (p. 48). The interrelationship between supervisors in collaborative team supervision is of great importance because it will have significant impact on the student. Manathunga [23] explores the power dynamics of team supervisors with data collected from four supervision teams (social sciences and humanities) on four consecutive occasions. These meetings were recorded and following each meeting, participants were asked to respond in an emailed reflection. The findings reflected both "generative and problematic" (p.30) aspects to the complex circulation of power within team supervision. Self and peer regulation increased as supervisors sought to moderate their language and behaviors, and support the student. This had the effect of empowering the student, whose positioning was raised by sharing the spotlight. However, communication confusions increased as it was less clear who or what was the subject of comments. The potential for confusing and conflicting advice is exacerbated through increased communication complexities. There was also some indication that there may be gender and power complexities that impact on the workings of the team. With increased transparency and accountability of team supervision, human frailties are also more exposed "add[ing] to rather than reduc[ing] the number of risks for all parties" [6] (p. 53). As Pole [10] succinctly states, a "supervisory team was not a relationship of equals and this may be reflected in the differing statuses of those involved and in their involvement with the student" (p. 265). This raises questions about the positioning of each participant in a collaborative team, and the degree of asymmetry of power relations and how these relations might be best managed.

Positioning of participants is addressed by Grant [22] as she explores the treacherous fields of power in postgraduate supervision. She tentatively maps the various interrelationships between supervisor, student and knowledge, and the hidden and largely unconscious mesh of desires that operate between the personal and professional positions of participants. Grant's offering is:

a map anchored to the stable institutional positions of supervisor, student, and thesis, but criss-crossed by unpredictable relations between selves and social positions, between reason and

desire, between past experiences, present actions, and future hopes. These relations overlap and intersect, confuse and interfere with each other. Crucially for our understanding of pedagogy, the map expands pedagogical relations beyond the supervisor-student horizon in several directions. In one direction, it expands them to include the social positions of those who take up the places of supervisor and student. These positions exert their own 'truths' of the self, shaping the ways in which individuals enact themselves as student and supervisor as well as the expectations and desires they have of each other (p. 187).

Further to this complex set of interrelationships are the hidden voices of communities of professional practices and the place of the thesis as a statement of paradoxical juggling that produces new knowledge independently by the student. Grant suggests that incoming postgraduate students should be better prepared for the intensity of supervisor-student interrelationships, and have access to more dispersed learning support throughout their studies.

Grant collected data from an hour long recorded meeting between a master's student and supervisor, and written notes from both participants that were responses to questions from the researcher. Grant drew on critical discourse analysis to interrogate the data for the discourse languaging that operates within fields of knowledge and power constructs. While the data source is very limited and Grant's voice is speculative, her exposition is a refreshing move to understanding power operating as positive and productive rather than negatively as an imposition.

Power, both productive and problematic is a strong theme throughout Grant [24]. She explores the supervisory relationship between students and supervisors in part through a Hegelian Master/Slave lens. In doing this the triangular relationship between the supervisor, the student and the thesis is explained as the thesis being the joint 'object of desire'. There is interplay of desires in the asymmetric binding of the relationship that is the productive ground for the development of new knowledge. As a shared artefact both parties have a vested interest in a successful outcome, as an embodiment of themselves. A thesis is expected to be the independent work of the student; the student must do the work but doesn't know how, requiring guidance from the 'master' thus creating an unstable discursive context. Grant juxtaposes Hegel with Foucault's concepts of governmentality, exploring concepts of constraint and freedom that co-exist within the supervisory relationship, placing the joint 'object of desire' within the confines of structuration, which sheds light on what Johnson et al. described as the paradox of doctoral studies. Grant acknowledges the limitations of interpreting all supervisory relations as master/slave, and the thesis as being only one of the desires of the parties – there are other desires that

may be satisfied in the process. A Hegelian interpretation would also suggest a fixedness of the relationship which would most likely falter in an examination of supervisory relationships in doctoral studies. There are however, elements of this analysis that go some way to understanding the subjectivities and positioning of the interrelationship.

Grant's [23] [24] studies on pedagogy and power circulation are highly informative. However, her data is drawn from traditional models of supervision, with one supervisor and one student. In mapping the complex fields and dynamics of power, some insight might be gained in the additional layers of complexity that collaborative team supervision must entail. The important question is how this might be best managed to gain greatest benefit and avoid the pitfalls.

### 3.6. Gaps in the literature

Mid-career doctoral candidates are an under-researched group generally and little work has been conducted to investigate how the professional knowledge, life experience and cultural background of this cohort affect the dynamics of collaborative team supervision.

## 4. Methodology

This study is framed within Constructivist epistemology, acknowledging that learning and knowledge is socially constructed, and ordered according to an individual's culture and life experience.

A qualitative approach of face to face semi-structured interviews will provide data. Two independent cohorts; one of supervisors recognized within the profession for the quality of the teaching, and with experience of collaborative supervision of mid-career doctoral students; and mid-career doctoral students who have experienced collaborative team supervision during their thesis development. Each participant will be interviewed twice for about 30 minutes, with about a month between interviews. This will allow for member checking and the opportunity to follow up issues raised in the initial interview or issues raised by other participants. Interviews will be conducted face to face where possible, or by Skype if necessary. Interviews will be transcribed and all identifying data will be removed. NVivo will be used to code data to establish patterns and themes. Critical Discourse Analysis will be used to interrogate the interview data, as a way of examining the power dynamic embedded in the respective roles of supervisor and candidate, to determine any impact this might have on learning. Data gathering is currently underway.

## 5. Findings and Discussion

Early data suggests that intentional design is a significant factor in successful learning outcomes. Establishing the respective roles of team members even before the student is met with, and determining milestone expectations in advance are seen as important. Using student profiling and the application process where students are required to submit an outline of their intended study, some aspects of student strengths and weaknesses can be provisionally foreseen and factored into proposed pedagogic strategies. In early team meetings with the student the frequency, duration, location and format of meetings (as a team, or with individuals according to their field of expertise), need to be discussed and agreed upon by all parties. Protocols for obtaining feedback and the nature of the feedback need to be determined, with an emphasis on the appropriacy and targeting of supervisor feedback for student development. In determining team pedagogy and making expectations clear, confusion can be largely avoided.

Early data also suggests that collaborative team supervision may be highly suited to students who are open minded and willing to listen, engage and try new things. While these characteristics are not age exclusive, maturity may be a contributing factor. For those students who are unsure of themselves and who do not have the academic capital from family background, robust discussion between supervisors in meetings can be overwhelming. However, there is also a view that it is the responsibility of the supervisory team to ensure that the characteristics of the student be addressed by intentional pedagogy.

Collaborative team arrangements potentially provide an enriched learning environment for all stakeholders with supervisors having the opportunity to learn from colleagues, especially those from other disciplines, as well as from the candidate. Where supervisory teams are cross-disciplinary, and the student is empowered to engage in discussions of epistemology, methodology and research data interpretation, the benefits are great for all stakeholders, and the approach to the research problem given greater depth.

The role played by the principal supervisor is an important aspect, particularly is the initial setting up of the team. While students who might be in a strong position to identify appropriate supervisory team members may be advantaged, the knowledge and experience of the principal supervisor in screening members for their capacity to contribute both appropriate expertise and capacity to work well in collaborative team contexts is crucial. Once established, the principal supervisor plays a key role in maintaining harmonious working relationships within the team and to some extent shielding the candidate from disagreements between team

members and contradictory advice. In a number of examples however, this role fell on less experienced co-supervisors who attempted to compensate for senior colleagues whose focus was not on the candidate's project. Repeatedly, the positioning of the student and their research development as the central focus is seen as a key to successful learning outcomes.

Another important role for principal supervisors is the setting up of communities of practice of doctoral candidates working with the same supervisor, where students met together with the supervisor, discussed issues related to their studies, read each other's work and gave peer feedback. Communities of practice, often established during compulsory course-work components, are seen as an important source of support and academic identity development for candidates.

With limited data available it is unclear if the extensive prior professional knowledge of mid-career candidates increases their capacity to work collaboratively, or if there are other factors such as external work and family commitments that act positively or negatively in this regard. It may also be argued that intentional design of team pedagogy adjusts for individual candidate differences.

## 6. Expected outcomes

Pedagogic interaction between supervisors and mid-later career doctoral is an under theorized aspect of doctoral studies. This study explores the interactions that are designed into the pedagogy of collaborative team supervision of doctoral students in social sciences, humanities and education disciplines. The study aims to (1) add to the evidence and knowledge base into pedagogic interactions associated with doctoral supervision; (2) increase understanding of power relations that may be present in supervisor and student interactions; (3) see interaction enhanced through the design of a pedagogic framework; (4) contribute to greater understanding of how design and management of interactions may improve learning outcomes. The benefits of this research will be increased understanding of effective collaborative team supervision pedagogies and lead to improved learning outcomes for stakeholders.

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