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Supervision of professional doctoral students: investigating pedagogy for supporting critical voice and theorisation.

Research report

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Executive summary

The research sought to understand more fully doctoral supervisory processes; specifically, how supervisors can support the development of *critical voice* and *theorisation* with Professional Doctorate in Education (EdD) students. The study was based on interviews with supervisors, a documentary analysis of programmes and group interviews with students from five EdD programmes around the UK. An inductive thematic analysis (after Miles, Huberman and Saldana, 2013) was undertaken of data, informed by literature.

The research illustrates the complexity of supervisors' pedagogical approaches and doctoral practices. Specifically it exposes the complexity of supervisors' pedagogical approaches in supporting EdD students developing critical voice, theory and theorisation. Using Bernstein's notion of 'pedagogic relations', it considers the influence of competing discourses, place and space, relationships and physical/conceptual resources that operate to shape practice (Bernstein and Solomon, 1999). This sheds light on the tensions and embedded assumptions that are largely taken for granted in the literature and in institutional practices.

The findings consider four themes arising from the research.

- *Epistemological shift* offers an explanatory framework to understand how students negotiate shifts in epistemology and practice.
- *Theory and theorizing* reveals three ways of distinguishing how supervisor's tacit practices are enacted.
- *Identity* illuminates the complexity of supervisors' identity construction.
- *Research gaze* reveals the pressure and issues emerging from the tensions at large in doctoral education where excellence and diversity run concurrently within the supervisory process.

The research invites the reader to engage with questions that we hope prompt EdD participants – both staff and students – to further discuss the nature and practice of doctoral education within, and beyond, their own institutional settings.

Main report

The context of the study

The rapid rise of professional doctorates in UK universities over the last 20+ years has spawned a similar increase in research about both student experiences (e.g. Burgess, Weller & Wellington, 2011; Odena & Burgess, 2017; Wellington & Sikes, 2006) and the work of supervisors (e.g. Åkerlind & McAlpine, 2015; Halse, 2011; Halse & Malfroy, 2010; Lee, 2008; McCallin & Nayar, 2012). The latter is increasingly focused on process and procedure aimed at making students' experiences 'smoother', more successful and more efficient. There is much less written about the pedagogical issues involved in supervision and in doctoral learning as a thesis student. As Boud and Lee (2005, p.502) point out there remains:

a lack of strong public discourse of pedagogy for research education, particularly one that accounts for the growing size, complexity and pressure for change experienced by the higher education sector in recent times.

As universities become increasingly marketised and business-oriented, academics tend to be pushed into the 'production' of doctoral degrees to satisfy completion rates, one important metric used in evaluating university departments (Bastalich, 2015; Ginn, 2014; Halse & Malfroy, 2010). Universities are required to provide research degree training which increasingly frames how supervisory practice is constructed. In addition, approaches to the management and monitoring of supervisor development are increasingly viewed as essential to quality assurance and to be, in part, the answer to driving the improvement in approaches to supervision within universities (Deuchar, 2008; Halse & Malfroy, 2010; Kiley, 2011). In relation to this context, previous work (Pratt *et al.*, 2014; Shaughnessy & Pratt, 2016) has identified a number of specific issues that tend to complicate doctoral learning.

First, there is the significance of developing knowledge from, and in, professional practice; the relationship between 'practice', 'theory/theorising' and 'academic' work being problematic, not least in defining what each of them is.

Second, participants in professional doctorates take on multiple roles and undertake the programme for multiple reasons. Students slip between their paid professional work, their doctoral study and their personal lives in complex ways (Pratt *et al.*, 2014; Wellington & Sikes, 2006). Indeed, on EdDs, 'students' may also be members of staff of the institution in which the programme lies, adding to the complexity of legitimacy (Goodall *et al.*, 2017; Moran & Misra, 2018). Whereas the literature tends to talk about students' work on the EdD in terms of a binary, from novice to expert, in practice things are more complex than this. A student who works as, say, a head teacher in a local

school, or as a senior administrator in the university itself, and who has completed a master's degree, will be 'expert' in her/his professional field, probably reasonably proficient as a researcher methodologically, but is likely to be a novice theoretician and may well not identify as feeling legitimate in an academic community (Moran & Misra, 2018).

Third, because EdD students enter programmes as professionals rooted in everyday educational practice, they tend to experience an *epistemological shift* as they move from a common-sense, professional space to an academic one in which they are likely to be encouraged to see the world as socially constructed (Pratt *et al.*, 2014). Our starting point for this study is to theorise this process as shown in figure 1 (Shaughnessy & Pratt, 2016).

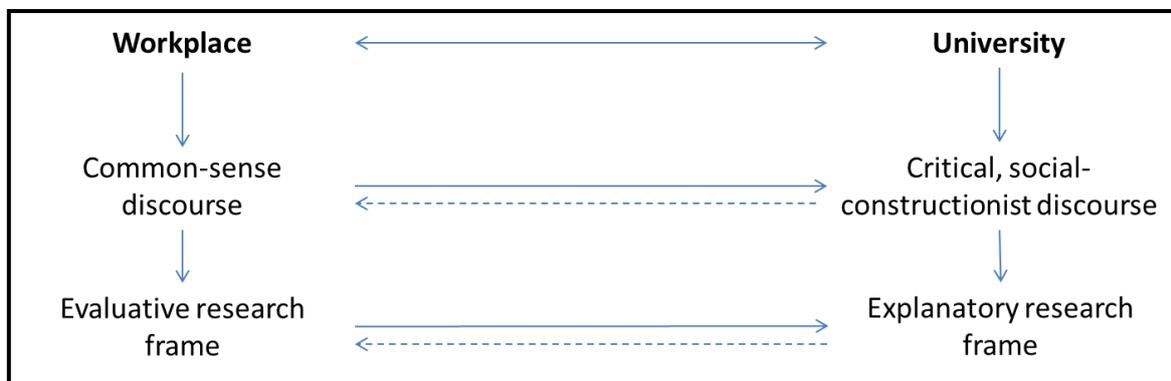


Figure 1: Theorising the 'Epistemological shift' from workplace to university.

Workplaces are utilitarian; not in any deficit sense, but because the job of those working there is to carry out their work effectively and efficiently in whatever way is deemed appropriate by the institution itself. This demands what Lave (2011) has called a 'common-sense discourse', one in which the world tends to be taken as objective, at face value and where the 'method' of professional practice is evaluative, examining and accounting for decisions that are being made within the organisation. Conversely, the university setting asks students to adopt a more critical position. Most (though not all) EdD programmes are rooted in social constructionism (e.g. Burr, 2003), which can be a far-cry from common-sense rationality. Whatever the philosophical grounding, the purpose of doctoral study is not simply evaluative, but aims to be explanatory. As Walker *et al.* (2008) note, doctoral education prepares students to both understand what is known and discover what is unknown and, hence, to develop a thesis with significance and originality, students must not just describe their professional world but theorise it so as to *explain* it in ways which provide new insights and understanding.

We know that these kinds of shifts can shake up the world-view of the experienced professional (Burgess, Weller & Wellington, 2011; Pratt *et al.*, 2014), questioning both

the research process and their professional judgements. The challenge is to find a 'doctoral voice' which is appropriately critical and yet aligned with their workplace practice. Consequently, we argue that, whilst EdDs are rooted in practice, theory – and on-going theorising – is vital, both in critiquing that which is familiar and in then negotiating shifts in epistemology and practice. It is the implications of all this for supervisory practice, which form the basis for our research objectives, below.

Pedagogic relations

In what follows we adopt a particular view of pedagogy based on Bernstein's (Bernstein & Solomon, 1999) notion of 'pedagogic relations' that is, the formation of relationships that 'shape pedagogical communications and their relevant contexts' (ibid., p.267) and which provide the potential to learn. Importantly therefore, pedagogy is not simply an act of 'teaching', but the formation of a relationship – between people, and also between people and artefacts – which provides the potential for learning to take place, including, of course, learning to become a new person in some way (identity change).

Research objectives

Our objectives were to:

- reveal how supervisors find ways to engage EdD students in developing an appropriate *critical, doctoral 'voice'*;
- investigate how these supervisory practices have the potential to improve research students' experiences;
- understand the nature and process of *theorising* – how supervisory practices form part of a 'curriculum' designed to support research students in using theory to develop practice.

Methodology

The study was framed in a social constructionist epistemology and the generation of data was undertaken by both researchers. The method was previously trialled and developed from a pilot study (Shaughnessy & Pratt, 2016), used to develop commonality of approach between us. Three forms of data were generated, as follows.

Supervisor Interviews

We used our contacts in the EdD Directors' National Network to find five institutions, purposively chosen to represent EdD programmes from a range of different education departments. Table 1 gives a brief résumé of their characteristics. Members of staff were contacted via the local EdD programme director and took part on a voluntary basis, meaning that, though we aimed to speak to three participants in each organisation, we had only two in some places and four in others, totalling 17. We undertook an individual, face-to-face, semi-structured interview with each of these supervisors in which we aimed to help them elucidate the way in which they worked with students at the thesis stage of the EdD. These took between 60 and 90 minutes each providing approximately 20 hours of recordings which were then professionally transcribed.

Student interviews

We also undertook interviews with one student from each institution. In one case this was not possible and in another two students volunteered and we interviewed them both, providing data from five participants and approximately five hours of recording. Because students are typically part-time and not on campus, these were undertaken by Skype and recorded using an audio recorder next to the speakers.

HEI North (Post-92)
Erica Amy Larry Ann
<i>No Student participant</i>
HEI Central (Post-92)
Oscar Diane Nick
<i>Students:</i> Yvonne Robert
HEI Greater London (Post-92)
Edward Naomi
<i>Student:</i> Vince
HEI Greater London (Pre-92)
Ingrid Len Andrew Helen
<i>Student:</i> Laura
HEI Southern (Pre-92)
Simon Gina Debbie Kath
<i>Student:</i> Sam

Table 1 - Participants

Documentary analysis and literature review

We undertook both a literature review around doctoral supervision and theorisation and an analysis of programme materials – EdD programme specifications, student handbooks and research development programmes. The former was carried out by a research assistant using a systematic search of the literature – see appendix 1 for a description of the way in which this was conducted – to identify current research and to contextualise the study.

Analysis

An inductive, thematic analysis (after Miles, Huberman & Saldana, 2013) of all the interview data and the institutional documentation was undertaken, informed by our reading of the literature, to examine supervisory practices, the development of critical voice and processes of theorisation.

The research was guided by the BERA Ethical Guidelines for Educational Research (2011), noting that whilst we could anonymise participants in outputs, the relatively close-knit world of EdD programmes means that it may be possible for readers to identify people from context. Particular attention was drawn to this point in gaining participant consent, in addition to the other ethical procedures, for which formal approval was gained at both Plymouth University and the University of Roehampton.

Analysis

Our focus was not simply on direct teaching but on how supervisors set up pedagogic relations (between people, or between people and physical/conceptual resources) providing the potential to learn. For this short report, data is drawn mainly from supervisor interviews, unless otherwise stated.

Theories, theorising and critical voice

Our focus on theory, theorising and critical voice deliberately explored how supervisors supported students in coming across, making sense of and using theory in their work. Holbrook, Bourke and Fairbairn (2015, p.75) note that 'learning about theory is pivotal to building an understanding of disciplined inquiry and becoming a researcher'. Debbie reflected the challenge of theorising in referring to the epistemological shift we noted above – from professional evaluation to doctoral analysis – suggesting that,

what we get is people doing the EdD who have done a lot of reports for governors and they may have done their master's through bits and pieces of SENCo courses or the Master's Scheme when that was running and so on and so forth. ... So, they're building on work that is not, doesn't necessarily easily lead them into the nature of theorising that's required at doctoral level.

Theory, and or theorising, were seen as vital to doctoral work, leading to several questions relating to *kind, origin and mobilisation*.

Questions of Kind: *what is being theorised?*

It was possible to understand 'theory' in one of at least two distinct ways. In some programmes the conviction that the EdD should be rooted in students' own professional fields meant that the surfacing of professional, often tacit, knowledge was the focal point for developing their thesis. In such cases, theorisation tended to be more focused on methodology, describing supervision

in terms of moving their thinking on to a more theoretical level, a greater understanding of methodology, a greater understanding of credibility of research and how research might be beneficial to practice and to academic, the academic world. (Larry)

In other programmes, theory was seen much more as relating to critical, social themes which were the starting point for the thesis, with methodological theorising then emerging from them. In this version of theory '*you've steered them somewhat, it's true, but people can identify a perspective that is of real relevance to the thesis and can give the thesis some kind of theoretical underpinning*' (Andrew). Students were encouraged to 'map out' the 'field' of research as a starting point for theorising it.

Questions of Origin: *where does theory stem from?*

For some programmes, the early modular stages of the doctorate focused on critical professional self-reflection and methodological design. In such cases theory often arose in relation to method, but the introduction of specific social theories tended to be opportunistic. Elsewhere the introduction of specific theorists was more deliberate so that

we look at a range of theorists, post-modernism, the collapse of post-modernism ... so we look at quite divergent theorists, they don't converge, they diverge and students, they seem to go to one or other. (Nick)

Several programmes had modules which focused explicitly on the idea and use of theory; for example, for Gina it *'was quite important to me that we had that somewhere in there that says it's not just about practice, it's actually about understanding why practice is as it is or how it could be different if we thought about it differently'*. However, she also noted that *'it's tricky, and I think one has to acknowledge that because of the nature of doctoral studies, students may be finding stuff out that isn't covered by, or that doesn't articulate well with the theories that they're using'*. Amy's response to this dilemma was to make *'the theory module the initial scoping of who theorises, find out who the theorists are in your area of research rather than bringing a theorist to the area of study'*.

The choices to make between a deliberate or more opportunistic approach to introducing theory to students also points to the nature of originality in the EdD thesis. The UK Quality Assurance Agency for Higher Education (QAA) suggests that *'professional doctorates aim to develop an individual's professional practice and to support them in producing a contribution to (professional) knowledge'* (QAA, 2014, p.30) and that *'the candidate's research may result directly in organisational or policy-related change'* (QAA, 2015, p.9). Amongst our sample it was evident that there was considerable difference in supervisors' thinking around such outcomes and the potential tensions between it being *'the same'*, yet *'different'*.

Definitely, I would want to be able to feel a sense that that thesis is more than a thesis, it's more than a piece of writing or thinking ... that there would be, it's a manual, a document, a resource, a way of instigating something. (Kath)

If they could theorise something that hadn't previously been theorised, so for instance a new practice, I could see a very powerful EdD and situate that in terms of practice, that what you're doing is shining light on a practice that hasn't had the light shone upon it before. (Oscar)

In addition to the significance of the thesis, it can also be far from easy to distinguish what is meant by *originality*:

I mean, social relations and social actions and social practices and social theory are all so complex. It's difficult to know whether one has found something or gained an insight that's truly innovative ...I think that's quite difficult. So, it's much more about how you do it and how you express it than about what it was that you actually did. (Gina)

As Yvonne comments *'I find that quite challenging, the whole notion of doctoralness, originality ... because I think "oh God, there is a lot of literature about this but what's different about mine?"'* (Yvonne – student). Any solution to this dilemma is likely to rest on the supervisor's ability to help the student identify and articulate what is original in relation to their field of inquiry; a process that might not be easy for supervisors obligated to work outside of their disciplinary area – see below.

Questions of Mobilisation: how is theory being put to use?

As we stated above, in making the transition to and from the professional and the academic, students are making an epistemological shift that is challenging. In supporting them, supervisors are engaged in a process of helping students to see the familiar as strange again and theory plays a key role. Two participants used the idea of 'mobilisation', one asking *'how are you going to mobilise all this knowledge you have now?'* (Diane) which seemed to us to describe the process well.

A common metaphor for such supervisory work was around learning a new language, one in which students had to learn to speak with different 'voices'. Wisker (2015) notes a similar situation with PhD students, but here, in the EdD, there is the added complication of professional voice,

so we might start with some autobiographical voice and then we look at a more political voice around policy and then you might use another voice, which is around the literature, a discussion of what's known and what's out there ... I've noticed people, Prof Doc students, have found it really difficult to switch between those voices and ideas. (Kath)

Unsurprisingly, this is challenging for students, not wanting *'to let go of what's been good for you or what's worked well'* (Kath) and involves exposing themselves to a considerable degree of risk, significant conceptual confusion and emotional shifts before reaching a point at which they can theorise confidently and feel ownership over their ideas; *'that's where the voice comes through as well and you're saying it's a voice based on evidence, but it's still your voice now'* (Debbie).

Supervisory process and the development of identities

Given the challenge for EdD students in moving between the professional and doctoral stances, supervisors had a range of strategies to support them: asking students to read particular papers/authors; the production of pieces of writing for critique; and, facilitating individual and group tutorials. Whilst we advocate these strategies, our

focus here is on several findings that we think have been paid less attention and on how they interact with them. We conceive of three broad categories of supervisory relationship from our reading of the data.

Focused on procedure. A sense of ‘doing to’, in which supervisory processes are focused on supervisors identifying and remediating students’ needs, undertaking the roles and responsibilities within the institutional frameworks and implementing the management systems in place to monitor and encourage progress.

Focused on practices. A sense of ‘doing with’, in which supervision is largely about forming a relationship with students which will support their induction into doctoral practices in general and into the discipline in use specifically; often described by means of the metaphor of a journey in support of a shift in the candidate’s identity.

Focused on skill/concept development. A sense of ‘working on’ (training) the development of the candidate’s research skills by, for example modelling reflection and critical thinking, providing oral and written feedback to support knowledge construction and providing methodological training.

There is also no sense in which one is better or worse than the others, not least since they seemed inclusive of each other, being tacitly blended in supervisors’ comments. As constructs describing forms of supervisory practice, each has implications for students’ development the manner in which each is enacted that matters. In both the research literature on supervision and the policy guidance there is a dominance of metaphors relating to supervision which positions the supervisor as expert/master. For example:

Doctoral candidates learn to research primarily through undertaking research under the expert guidance of supervisors, and are supported through training in research skills and methods, which is usually provided by the institution. (QAA, 2011, p.11)

The novice researcher learns from their supervisor’s support in the development of the research process and a set of generic research skills. In this approach, the dominant assumption is one of a deficit model of the student and the most important ingredient for the supervision therefore becomes subject expertise. This has powerful overtones regarding how supervisory pedagogy is perceived in terms of looking over, and looking after, the production of academic knowledge (Zeegers & Barron, 2012).

As we began to note in the previous section, we see many of these points as issues of identification. Clearly, EdD students need to develop expertise in terms of the research process and the theorisation of educational ideas. Students seek out, and are ultimately paying for, this. But learning to undertake effective research in education is not easy. For Yvonne, even though she works in a senior position in a university

faculty, her past life as an FE teacher still means that *'I've really struggled with seeing myself as a researcher, it seems a bit pretentious'*. No amount of skills training will overcome these feelings for Yvonne; and changes in identifying oneself as a researcher can come late on in the process, Amy noting that for one supervisee *'that real feeling differently about herself and as a researcher didn't come until after the viva'*.

Students in our sample pointed to some important moments in identity formation including the requirement to present to colleagues and to take part in local or (inter)national conferences. In structural terms, nearly all EdD programmes use a gradual transition from professional to professional/researcher through having two stages – a modular stage over two years and a thesis stage over three or more. One interesting finding therefore was that this did not always feel supportive for students, some of whom reported feeling that:

I wouldn't say it was a hiatus but I missed the structure of things. ... I guess what I'm missing is that community of practice, if that makes sense, that was there a natural part of taught sessions.

Other students reported feelings of loss over the way a previously supportive group had dissolved, leaving them feeling isolated and reinforcing the notion that research is a lonely pursuit.

However, of even more interest to us has been our findings related to the identity of supervisors too. Again, the official guidance from QAA quoted above belies the complexity of 'expertise' on EdD programmes in which students, not supervisors, are expert in their own professional practice. Gina notes that *'I guess I'm not alone in being ... I'm supervising people whose work interests me, but I'm not an expert in the topic'* and Kath, who is relatively new to doctoral supervision feels that *'I suppose there's this inferiority thing that comes in, that I'm very conscious [of] at this very early stage of supervising, because they have their expertise in their field'*. This is a form of *obligated* supervision driven by the pragmatic need to find supervisors. Even for Amy who has had a number of doctoral completions and successfully run an EdD programme, she sees her strengths in working on theory with students as

actually com[ing] from a place of insecurity. ... I don't come from a discipline that fits in education, like normally, I'm not a sociologist, well not by training I'm not and I feel that really keenly ... [I] always feels a bit of an imposter.

We contend then that it may be important to consider further the identity of supervisors. In traditional PhDs the supervisor remains stationary (in a metaphorical sense), supporting the movement of the student into 'their' disciplinary, methodological and academic workplace. In the EdD, supervisory 'obligations' see them in a more complex nexus of expertise and novice-hood. How supervisors identify themselves in relation

to their history – as educational professional or research professional – and their subject discipline, seem important; the first affecting their confidence to engage in discussions around professional knowledge and the second affecting the kind of research stance that they are likely to bring to the supervision, and hence the kinds of research that can be undertaken.

Ownership, Responsibility and Risk

For students, finding ways to feel confident in their theorisation so that they come to the viva confident in the originality and quality of their work is a demanding task. The apparently supportive stage 1 (modular) part of the EdD can actually militate against this confidence, because *'with the taught elements you're in a room with others, so you're still in that potentially passive environment'* (Debbie). Passivity, through the idea of modules being 'taught', can leave students feeling dependent on their tutors for direction, and present a dilemma for supervisors in the sense that *'the more directive you are, the more dependent they become, and that's not a good thing in the end'* (Gina).

Supervisors spoke with great passion about their work and the desire to support people in their doctoral 'journey', as well as about feeling 'protective' (Kath) and having to 'take the hit' if they fail at something (Ingrid). But in an increasingly marketised HE environment there is an increased focus on completion rates and being accountable, meaning that supervisors are often caught in a tension around the management of risk. As Ingrid describes,

They move beyond you and it's an interesting balance as a supervisor isn't it, so what extent to you try and keep them on this path because it's going to be a quick completion and we all know what we're doing. Or allow that exploration into something that actually I know nothing about.

Supervision therefore involves a balancing act; supporting opportunities for invention, originality and professionally appropriate outcomes whilst managing the risk that this brings in terms of one's expertise and the potential demands of the viva. In our sample we found examples of supervisors wanting their students to explore their doctoral work in novel ways – using song or poetry for example. On the other hand, the majority of supervisors were perhaps more cautious, feeling that *'you don't want to do something that's risky for them and encourage them towards something and then someone else not get it'* (Erica). EdD programmes have 'different structures and attract candidates at distinct stages of their lives and careers' (QAA, 2015, p.14) and often set out to provide opportunities for widening participation at doctoral level, deliberately trying to attract people into doctoral study who require a more structured route to support doctoral study. These students are, by their very nature, 'at risk' in attempting something that is new to them. The institutional push towards safe, timely completions

is, we contend, likely to make it harder for such people to be successful, and hence harder to recruit.

Conclusions / Recommendations

The research illustrates the complexity of supervisors' pedagogical approaches in supporting EdD students' development of critical voice, theory and theorisation. What is apparent is the influence of competing discourses, place and space, relationships and physical/conceptual resources that operate to shape practice; shedding light on the tensions and embedded assumptions that are largely taken for granted in the literature and in institutional practices.

Four themes arise from the research, which we use to offer the reader starting points for further consideration.

Epistemological shift

We propose that the model of an epistemological shift offers an explanatory framework from which to understand the interplay between common sense and critical discourse. We argue that understanding arises out of pedagogic relations which come about through supervision and in the movement from a common-sense professional discourse of their workplace setting, mostly based on an evaluative research framework, to a critical, social-constructionist discourse. The latter offers an explanatory framework, from which it is possible to see the world differently.

Questions:

1. To what extent is an epistemological shift apparent in various programmes?
2. What assumptions are being taken-for-granted and how do they dominate doctoral practices?
3. How might simplistic binaries associated with apprenticeship/mastery and professional/researcher be more fully theorized by both supervisors and students?

Theory and Theorising

The research distinguishes three ways in which supervisors support students in making sense of theory and theorisation. We suggest this reveals insights into tacit supervisory practices; and we that questions of kind, origin and mobilisation are often taken for granted in doctoral programmes and the literature, yet are the pivotal point for theorizing that is likely to lead to doctoral outcomes.

Questions:

1. How are students confronted with theory in a range of different ways?
2. What is the balance between theory of method and theory of educational themes?
3. Where/how do these theories originate and how does this affect the way students engage with them?
4. How is theory mobilized by supervisors and students working together?

Identity

A theme running through the research is the complexity of supervisor identity, where traditional conceptualisations of supervision, as transmission of subject expertise, are challenged. We suggest that the research findings question this dominant assumption of student as 'deficit'. Rather, EdDs imply more fluid notions of 'expertise', being both embodied and workplace-orientated. These create challenges for supervisors and disrupt traditional notions of legitimacy because movement between the professional and academic spheres operates in both directions, and for both students and supervisors. The latter must feel legitimate as an expert in professional, disciplinary and methodological terms. There is a paucity of literature which explores identity formation of supervisors and we suggest that supervisory development appears, on the surface, to mirror features of the epistemological shift for students.

Questions:

1. In what ways do supervisors feel legitimised and, if not, why?
2. What forms of supervision (see categories above) are used most/least and how do these relate to supervisors' identities/histories?

Research Gaze

As the range of doctoral routes increases, a tension develops between 'excellence and diversity'. This places pressure on the supervisory process in institutional settings, increasing regulation and training, which are relatively easy to capture in sets of prescriptive practices. This leads to the 'transmission of skills and competences' and 'procedures' being equated with 'good supervision', mainly to monitor and manage doctoral milestones. In contrast, we suggest the process whereby the intellectual and social practices of the discipline are gradually internalised is harder to articulate and quantify.

Questions:

1. How is good supervision constructed in the institution?
2. Where do these constructions come from and how are they arrived at?
3. What might they miss, and how can it be (re)captured?
4. (How) might this privilege or prejudice certain student groups?

Appendices

Appendix 1 – Methodology for the literature review

The literature review involved searches run on Australian Education Index, British Education Index, and Education Abstracts (EbscoHost) for the following phrases (in each search the term 'PhD' was also included as an 'or' condition):

- Doctoral Critical Thinking
- Doctoral Supervision
- Doctoral Relationships
- Doctoral Mentoring
- Doctoral Models
- Doctoral Learning
- Doctoral Learning Theory
- Doctoral Social Theory
- Doctoral Writing
- Doctoral Theorising
- Doctoral Apprenticeships
- Academic Thinking in Doctoral Supervision
- Critical Thinking in Doctoral Supervision
- Theory in Doctoral Supervision

In total 6368 sources were returned. Removing duplicates reduced this to 5860. Removing obviously unrelated content reduced this to 2823, which were then scanned by title and abstract to filter them over several passes. Sources were removed from consideration if they were clearly focused on issues that did not relate to theorising and the development of doctoral voice through supervisory processes. Over several passes the number of likely relevant sources was reduced to 146. Of these 123 were journal articles, 10 annual survey reports (Australian version of the UK PRES), 1 thesis, 14 books or book chapters, and 18 conference papers. Our focus was on reviewing the peer-reviewed journal papers, particularly the most recent, and all but a few were available for review. The relationship with theory and/or process of supervision was present in these papers as follows (total > 146 as some papers included more than one theme):

Training/evaluating quality of supervisors and supervision	49
Supervision in professional/industry subjects	30
Of which Education or Teacher Training	12

Developing academic/critical thinking, 'doctoralness' / researcher identity	27
Pedagogy and process of supervision	27
Student views/reports on supervision	22
Comparison of different styles of supervision	20
Theory/epistemology in the PhD (not always through supervision)	13
Threshold concepts in PhDs and supervision	7
Generic skills development	6
Disciplinary differences	5

Notes from these papers were collated and used in our analysis.

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