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How are doctoral students supervised? Concepts of doctoral research supervision

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Literature about doctoral supervision has concentrated on describing the ever lengthening lists of functions that must be carried out. This functional approach is necessary, but there has been little exploration of a different paradigm, a conceptual approach towards research supervision. This article, based on interviews with supervisors from a range of disciplines, aims to fill this gap. The main concepts identified are: functional – where the issue is one of project management; enculturation – where the student is encouraged to become a member of the disciplinary community; critical thinking – where the student is encouraged to question and analyse their work; emancipation – where the student is encouraged to question and develop themselves; and developing a quality relationship – where the student is enthused, inspired and cared for. Supervisors of doctoral students are also trying to reconcile the tensions between their professional role as an academic and their personal self, as well as encouraging students to move along a path towards increasing independence. The concepts are examined in the light of these tensions. Finally, the research illuminates the power of the supervisor's own experience as a student, and suggests that supervisors need to be aware of both the positive and negative aspects of each of these conceptual approaches.

Introduction

We know that the supervisor can make or break a PhD student. More specifically, the communication *between* the supervisor and student is key (Ives and Rowley 2005). This article looks at the influences on this partnership mostly from the supervisors' perspective.

Much of the current literature concentrates on identifying the functions that the effective supervisor needs to carry out, with occasional reference to an enculturation, mentoring or parenting function (Pearson and Brew 2002; Wisker, Robinson, and Shacham 2007). Whilst the literature on learning and teaching has explored a conceptual approach in some depth (e.g. Entwistle 1997; Prosser and Trigwell 1999; Biggs 2003; Åkerlind 2004), there has been little similar exploration for supervision (Pearson and Kayrooz 2004; Neumann 2007). This report on a study of practices in a UK research-intensive university is intended to begin to fill this gap. It builds on the work of conceptualising research which was begun by Brew (2001) and Pearson and Brew (2002). The concepts that this article proposes map on to their work, and add a new dimension of 'developing a relationship' (Lee 2007a).

This article proposes that there are two key influences on supervisors' approach to supervision: firstly, their concept of research supervision, and, secondly, their own experience as a doctoral student. Pragmatic issues like time, workload pressures, and the need to ensure quality assurance mechanisms are satisfied, may push supervisors more into the functional approach, but understanding the implications of all these conceptions could enable supervisors to develop a wider range of approaches, maximise the advantages and minimise the disadvantages of each

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Table 1. A framework for concepts of research supervision.

	Functional	Enculturation	Critical thinking	Emancipation	Relationship development
Supervisor's activity	Rational progression through tasks	Gatekeeping	Evaluation, challenge	Mentoring, supporting constructivism	Supervising by experience, developing a relationship
Supervisor's knowledge and skills	Directing, project management	Diagnosis of deficiencies, coaching	Argument, analysis	Facilitation, reflection	Emotional intelligence
Possible student reaction	Obedience organised	Role modelling	Constant inquiry, fight or flight	Personal growth, reframing	Emotional intelligence

category. The article also proposes widening the range of methodologies used to examine this issue.

The aim of this article is to explore what influences a supervisor's approach to their work with doctoral students. It proposes a framework of supervision which can be used both for the development of individual supervisors and to create a language which those involved in co-supervisory roles can use to negotiate and understand their respective roles. The framework has been created by examining the literature on supervision (Lee 2007a) through the filter of interviews with supervisors. The framework is outlined in Table 1.

As it is used here, the terminology of an 'academic concept' implies a definition and description of an approach, belief or experience about the nature of supervision, which can then be communicated but which is also drained of its contextual links (Entwistle 2007). This article begins to define the salient elements of these concepts so that readers can discern the key features. It also begins the exploration of the interconnections that create a firmer understanding of a professional/personal binary (see Table 2). The words 'approach' and 'categories' are used in this article to refer to the pragmatic level, the action informed by the concept.

Literature review

There is much sensitive work written about how to supervise doctoral students (Cryer 1997; Taylor and Beasley 2005; Wisker 2005), which has identified (ever increasing) lists of tasks for the supervisor to undertake and some suggestions for anticipating and handling problems. Whilst there has been less quantitative research carried out on the topic, there has been some qualitative research carried out by sociologists (Delamont, Atkinson, and Parry 2000). This has identified the powerful impact of the supervisor's previous experience as a PhD student on how they supervise now.

A phenomenological review of research provided a new, discipline-neutral, framework for understanding research, which proposed that experienced supervisors have views of research as: a series of tasks (domino variation), a production orientation (trading variation), a series of theories where the researcher is absent (layer variation), and an encounter where the researcher is transformed (journey variation) (Brew 2001). Brew argued that she had uncovered aspects of research which are often hidden from view, but which influence research at every level. She suggests that a focus on the trading variation (which leads to a focus on outputs and publications) leads funding bodies to lessen support for the 'blue skies' research which the journey conception (personal transformation) might encourage. She further argues that an unexplored difference in conceptions of research between supervisor and student could explain failure to complete.

Meyer (2007) has looked at modelling postgraduate students' conceptions of research as another way of exploring variation, and identified eight conceptually discrete dimensions of variation (research as: information gathering; discovering the truth; insightful exploration and discovery; analytical and systematic enquiry; incompleteness; the re-examination of existing knowledge; identifying and solving problems; and a set of misconceptions). This modelling approach has not yet been applied to postgraduate supervision.

Anthropologists would combine interviews and observation data to try to close the gap between espoused-theory and theory-in-use (Argyris and Schon 1974). In applying this approach to research in schools, Foster (1996) states that this could bridge the gap that has developed between qualitative and quantitative methodological approaches, and rightly argues that there is a need for a wide variety of methodological approaches to investigate educational phenomena. Postgraduate supervision has essentially been a private act between consenting adults, and pressure to open this to observation will raise hackles as well as ethical issues, but it could provide us with very helpful data.

This article reports on a research approach where the literature and the interviews have iteratively informed the development of the concepts. The theoretical level of the work has been informed by the reported practice of the interviewees and vice versa. This inevitably leads to some blurred boundaries between theory and practice, but I hope it also leads to a richer and more useful analysis and description.

Method

Ethical approval was given for the study by the university ethics committee. The study was carried out in accordance with the code of practice of the British Psychological Society. Supervisors chosen for interview (a purposive sample including varying lengths of experience and representing the main discipline groups) were given an information sheet and signed a consent form. They were able to withdraw at any time, but none of them did so. The interviews were semi-structured, recorded in speedwriting at the time and most were audio-taped. The interviewees were all offered the opportunity of reviewing their own transcript. A few took up the option, and no changes were made as a result of this process. Several interviewees asked for copies of articles as soon as they became available; one asked to see any articles before they were submitted. Having reviewed this article (and asking for no changes), he said he was happy to continue as a participant and had found both the interview and article helpful. This leads to consideration of the qualitative research interview as a therapeutic process (Birch and Miller 2000), and further exploration of this as a development opportunity is recommended.

Interviews took place with 12 supervisors from a range of disciplines in a research-intensive UK university. This data was later compared with interviews with two PhD students and a discussion group of PhD students for further illumination and to check for face validity. The 12 supervisors ranged from those with over 20 years' experience of working with doctoral students to those who were still supervising their first students. There were three female and nine male supervisors. Between them they had experience of supervising over 150 PhD students, both full and part time. The students were studying a mixture of conventional PhDs and professional doctorates.

A major finding was that the supervisors' own experiences (when they themselves were students) had a significant impact on how they now supervise. Interviewees were asked about their past experiences as PhD students, as well as their current work as supervisors. This means that this study also reflects a range of experiences from doctoral students at UK universities (including Oxford, London, Cardiff, Birmingham and Warwick) over the last 20 years.

The supervisors were asked a range of questions about their experience of supervising PhD students. These included asking them to describe what they actually did in their meetings, what they expected students to do, what problems arose and how they were coped with, what their objectives were and occupationally what their students have subsequently gone on to do. The interviewees were then asked about their own experiences as a doctoral student. Finally, the interviewees were invited to comment on the proposed approaches (see Table 1) to see if they were accepted for face validity and whether they could place themselves.

These questions therefore concentrated on the 'what' and the 'why' of the experience of supervision. The aim was to understand how supervision is experienced and perceived.

The methodological approach was deliberately broad. There was a symbiotic relationship between the literature review (Lee 2007a) and the data generated by the interviews. Initially the methodology was conceptually based on symbolic interactionism (Blumer 1969; Becker 1998). The analysis was designed to look for common objects about which the interviewees had some shared perceptions. The method of analysis was inspired by phenomenography (Åkerlind 2007), but this is not strictly a phenomenographic piece of work. An iterative analysis of the interview transcripts was carried out. A random first transcript was used to create an initial coding, which was carried out by hand, and these codes were then added to, amplified and amended by all the subsequent transcripts. The concepts were then compared again with the literature around each of these concepts. Initially, open coding was created and further examination was carried out to think about the various possible dimensions of the concepts. Axial coding led to examination of the consequences of each concept (Coffey and Atkinson 1996). The data were searched again, looking for perceptions around frequently used words such as 'good', 'problem' and 'writing'. The interviews were stopped when data showed signs of reaching saturation point. A second experienced researcher reviewed the data and the proposed coding.

The analysis let the case define the concept, accepted concepts as generalisations and relational, and then adopted approaches such as 'describe what you've found out, but without using any of the identifying characteristics of the actual case' (Becker 1998, 126).

The implication of the methods of analysis was that there is no such thing as 'pure data' free from any potential bias. The important issue is to discover the correct manner of interpreting the data we have (Hammersley and Atkinson 1983, 112). The assumption is that an integrative approach is ultimately ethical: social psychological, phenomenographic, sociological and linguistic methods of analysis can all help identify sensitising concepts (Blumer 1969).

However, one of the limits of this study is that it is based upon reported recall; a longitudinal ethnographic approach (including observation and video transcripts of supervisor/supervisee meetings) would be a helpful addition to this work.

Outcomes and discussion

Analysis of the transcripts illuminated, redefined and reorganised the concepts first proposed from the literature search. It also identified a series of tensions which supervisors try to reconcile and to which we will return.

Five main approaches to supervision were identified, which all link to the potential conflict between the academic and the personal self. These approaches are not independent of each other.

(1) Functional: where the issue is one of project management.
(2) Enculturation: where the student is encouraged to become a member of the disciplinary community.
(3) Critical thinking: where the student is encouraged to question and analyse their work.

(4) Emancipation: where the student is encouraged to question and develop themselves.
(5) Developing a quality relationship: where the student is enthused, inspired and cared for.

Each quotation that follows has been attributed to a disciplinary group (Becher and Trowler 2001): pure science, humanities, technology or applied social science.

Functional

Of the five main approaches that were identified, the functional approach is the one which sits most closely with the professional role of the academic. Many of the books written about effective supervision are instruction manuals. They are full of practical advice about interviewing, agreeing the ground rules, introducing the student to new colleagues, project and time management, raising ethical issues, transfer from MPhil to PhD, preparation for the viva and so on (Eley and Jennings 2005; Taylor and Beasley 2005; Wisker 2005). This is similar to the staged model, which gives priority to issues of skills development (Wisker 2005, 56–59). The supervisor's task becomes one of directing and project management.

Supervisors who were interviewed explained their functional responsibilities with clarity and often brevity.

> Day One I tell them: 'you have three years'. They are given a schedule. We are geared up for three years and know what can reasonably be achieved in three years rather than what is a complete piece of work. We have become more focused. People treat it like a 9–5 job. You have to do something that someone is prepared to pay for. (Technology)

> I have a weekly timetabled formal slot for them and follow-up if they do not turn up. (Pure science)

> The timeframe is: the first three months are more relaxed to search and do the literature survey, by the end of the first six months the focus of the work is fixed, at the end of the first year they will have completed their transfer report. We pressurise everyone to get them through. (Technology)

The requirement for students to be obedient was also evident here:

> In the second year we see them monthly and they produce 5000 words before each meeting. (Applied social science)

The functional approach could be extended to manage a group of PhD students:

> I organise regular pair or small group meetings with a supervisor where students present findings. (Pure science)

Although no interviewee confessed to doing this themselves, a couple of them admitted that the functional approach is a well-worn path for numbers of students who were all carrying out pieces of research which are part of a larger grand plan:

> I know of places where there is a PhD factory. (Applied social science)

This type of comment was made by three interviewees, and is an approach often attributed to the sciences. Only one of the interviewees in this case was a pure scientist. There are grounds, however, for believing that it applies to an approach which can span the disciplines.

Enculturation

In this perception achieving a PhD is about becoming a member of an academic discipline (Leonard 2001, 98). The supervisor's role in directing the student may become more apparent here and there is an apprenticeship element included in this model.

Conceptualising research communities as communities of practice enables us to look at the social dimensions of the research supervision model (Lave and Wenger 1991; Pearson and Brew 2002). There are issues of acculturation into the institution, the community of the discipline, the country/civilisation and epistemological access.

Supervisors may see themselves as being like the family doctor. They will provide some specific expertise, but will also be a gatekeeper to many more learning resources, specialist opinions and networks. The supervisor can choose which gates to open, particularly in the early stages of the researcher's life. Within this understanding, therefore, there is also an understanding of the power of the supervisor in its widest sense. Not only is the researcher 'present' (Brew 2001) in this model, the supervisor is also 'present' as well.

There is another aspect of the power dynamic that arises from the supervisor being gatekeeper to the qualification and the academic discipline: that of ownership (or even suppression) of the final result. Original research can be dangerous in that it can undermine previously dearly held beliefs and careers. The struggle can be political on several levels. The student needs to be aware of how powerful (or not) their supervisor is in the institution, and discussion about enculturation as a concept or an expectation could help the student to make realistic decisions. In the case of international students, the supervisor is also gatekeeper to an even bigger issue: the cultural context in which the degree is being taken (Wisker 2005, 202). There are opportunities for power games and argument about who 'owns' the research and subsequent conference presentations and publications.

At the beginning the student is offered 'legitimate peripheral participation':

> I believe they need to get in the lab straightaway, they learn more by doing practical work and then they will appreciate the literature. Initially I will suggest tasks and introduce them to the technical staff and lay out what I want done to get them started. (Technology)

> I give my book to all my students. (Technology)

> Students need to know what 'good enough' looks like. (Technology)

> I get them to do conference presentations and write proceedings, I go with them if they are presenting for the first time. (Humanities)

The supervisor aims to move to a point of independence, the objective is a 'mutual engagement, joint enterprise and a shared repertoire' (Cousin and Deepwell 2005, 59):

> I ask are they safe to be let loose on the community because technically those with a PhD are in charge of their own research. (Technology)

> I would feel I had failed if they did not stay in the field … my students all know their academic grandfather. (Technology)

The failure to move to independence causes anxiety:

> The students you worry about are those who still turn to you in the viva looking for confirmation that they are OK. (Technology)

Critical thinking

Conventionally, this is the heart of the PhD supervision. Brown and Freeman (2000, 302) offer the following definition:

> critical thinking comes in many forms, but all possess a single core feature. They presume that human arguments require evaluation if they are to be worthy of widespread respect. Hence critical thinking focuses on a set of skills and attitudes that enable a listener or reader to apply rational criteria to the reasoning of speakers and writers.

Stevenson and Brand (2006) point out that critical thinking is largely a western, secularist intellectual tradition, and we need to be sensitive to this when applying it in different cultures or to some disciplines.

In practice, this approach addresses such questions as what is the underlying conceptual framework, what are the arguments for and against, what has been considered and what has been left out. Wisker (2005) argues that practising using the metalanguage of viva defence is a very useful supervisory skill, because it ensures that the student addresses gaps in knowledge, boundaries and methodology.

Critical thinking implies a 'researcher absent' process (Brew 2001; Pearson and Brew 2002), and is only part of the model suggested by Barnett (1997) of 'critical being'. One version of this process has been called 'gentle Socratic inquiry' (Jackson 2001). The 'gentle' is inserted to counteract the image of Socratic inquiry, where the consummate lawyer cleverly manipulates his adversary into a position of 'got you'. Whilst the common perception of the Socratic method is a methodical questioning and cross-examining, peeling away layers of half-truths, exposing hidden assumptions, the gentler Socratic method proposed by Jackson assumes a position of cooperative inquiry and accepts that there is no right answer.

This type of critical thinking model typically works through three stages:

- problematising;
- finding connections; and
- uncovering conceptions/the shape of an answer.

Some writers support constructive controversy above gentleness. Johnson and Johnson (2001) argue that more than 40 studies indicate that constructive inquiry produces higher achievement and retention than concurrence-seeking debate.

The early stages of encouraging critical thinking were evident amongst the interviewees:

> They need to explain to me: 'why, what and how'. (Applied social science)

> I ask them to email me a question about their project every week. (Technology)

> I use 'magic' words to help them identify the thread in their argument: e.g. arguably, conversely, unanimously, essentially, early on, inevitably, etc. (Applied social science)

> I think my student is more geared up towards reporting than thinking. I told her to shift into second gear. Her thinking is there but it does not come out in her writing. I am going to inspire her to be brave and give her some tips on how to present her data and make her voice more distinctive. I am going to encourage her to use fill-in words such as 'conversely' to synthesise and structure thoughts. (Applied social science)

The movement towards independence is evident once again in this category:

> I avoid dependency by getting them to think about some problems and giving them resources. (Technology)

> I want them to stand on their own feet and challenge the thinking. (Technology)

> My tutor was not confrontational, she encouraged me to be critical of my own ideas. (Applied social science)

> Most students do make the leap from dogmatic to provisional thinking. (Humanities)

> At the end of the process I want the student to have the maturity to know when a good idea is worth following or not. (Technology)

Emancipation

Pearson and Kayrooz (2004) argue that research supervision is a facilitative process requiring support and challenge. It involves providing educational tasks and activities, which include: progressing the candidature, mentoring, coaching the research project, and sponsoring student participation in academic practice. This is similar to the journey conception identified by Brew (2001):

> I want to know what their connection is with the research, why are they asking this question? For student x it was not external research, it was quite existential. (Applied social science)

A defining question which can mark the line between the facilitation and enculturation model is: 'how much responsibility should the student or the supervisor take for arriving at the destination?' Mentoring is a powerful concept in this arena (Pearson and Brew 2002).

There is much literature on mentoring in general and facilitation skills in particular (Lee 2006, 2007b). The mentor is usually seen as a non-judgemental adviser. Mentoring builds upon Rogers' belief that self-experience and self-discovery are important facets of learning (Morton-Cooper and Palmer 2000).

Acknowledging the dependency stage, supervisors would say:

> I try to get them to admit and confront their problems. (Humanities)

> I act as a bridge between the knowledge and the student and eventually they don't need me. (Pure science)

Again there is acknowledgement that this is only a beginning:

> I am always waiting for that epiphany moment when they say 'no I don't agree'. (Technology)

> You get a lot of satisfaction, you have facilitated that growth in them. (Humanities)

The lack of need for control is what makes this category differ from enculturation:

> At the start you know a little bit more than them, but not much. Your job as a supervisor is to get them to the stage of knowing more than you. (Technology)

> I want it to have changed how they see the world. (Applied social science)

> Very few of my students are doing it for an academic career, they want the intellectual rewards. I want my students to have had adequate challenge and support to get that. (Applied social science)

The doctoral supervisor can enact a mentoring role in two ways in this situation: they can be responsible for doctoral students and for overseeing probationary staff acting as a co-supervisor (Code of Practice for Research Degrees 2000).

Relationship development

Wisker et al. (2003) argue that emotional intelligence and flexibility play a large part in working with students through to successful completion. There is some evidence that poor emotional intelligence, a mismatch in styles (such as when the student is still dependent but the supervision style is one of 'benign neglect') leads, unsurprisingly, to poor completion rates (Taylor and Beasley 2005, 69).

The need for a positive relationship was demonstrated again by Ives and Rowley (2005) in their interviews of supervisor/student dyads and, in particular, in their examination of relationships where there was dissatisfaction. They found that interruptions in the relationship caused students problems. In their work a good relationship did not necessarily imply friendship at the beginning; indeed, they suggest that friendship can get in the way of a good supervisory relationship because it might blunt the ability to be critical: 'The power dynamic between supervisor and student makes friendship difficult' (536). The interviewees in this piece of research identified additional difficult aspects of the friendship issue.

The more dependent side of this relationship rests on the supervisor taking the initiative. It includes a desire to enthuse, encourage, recognise achievement and offer pastoral support:

> Research supervision is a very personal thing. It is about relationships. If they don't have the motivation you need to fire the imagination, it is different for different students. (Pure science)

> I wanted to call my supervisor the moment I solved the tough maths. (Pure science)

> The more pastoral support of the supervisors was really important. I remember being surprised at how helpful they were. This was as important in helping me to get through as any intellectual support. (Applied social science)

Friendship at an early stage might cause difficulties, but after several years of close contact some supervisors found it became inescapable. There is also a pain associated with the relationship dimension:

> We ended up being good friends, she [my supervisor] was only seven years older than me. (Applied social science)

> My supervisors are lifelong friends. I am still angry with the student who passed and dropped off the end of the earth after five years working together. (Applied social science)

> I wish supervising was more like the critical thinking model – less concerned with the welfare of the student – because when they stab you in the back it would hurt less. I want to make sure they have a good time. (Applied social science)

The independent end of the relationship model was characterised by altruism:

> I really think my relationship with my supervisor opened my eyes. It was the character of my supervisor, it went beyond mere mentoring. He was considered unconventional, a maverick … My supervisor helped me with my writing but never pressed me to publish. (Applied social science)

Within this approach there are also issues relating to gender, caring and sexuality. It was interesting to observe the warmth with which one supervisor hugged his PhD student on her

return from holiday, but the communication was unspoken. Delamont, Atkinson, and Parry (2000) refer to the problems that can arise when sexual relationships are entered into, and suggest that the academic should follow the rules suggested by the medical profession in these cases. Two quotations illustrating the gender and caring issues are:

> Women tend to listen more and look at body language, rather than just listen to what is actually being said. 'Everything is fine'. Women are better at caring, for example, we will go through the data and then ask 'what's the real problem?' (Technology)

> It is important that students feel cared for. One of my student's father died in their first year. My experience is that there are some students who have a series of problems. When this student arrived he first was so ill he could not attend the induction, then his father died, then his wife went into hospital, then his wife got pregnant and depressed … children will demand attention … it all happened to one person, it was traumatic for me too. (Technology)

The relationship between student and supervisor has many facets, opportunities and problems. It is an arena where training can raise awareness, enable the creation of professional boundaries and prevent problems arising.

The tensions that PhD supervisors reported

In the course of the interviews supervisors were asked to describe problems they had encountered during supervisions. They reported a variety of tensions which they were trying to reconcile. These have been laid out along two dichotomies:

> Professional Role – Personal self
> Dependence – Independence

The tension between professional role and personal self was characterised by the professional requirement for completion versus a personal desire for quality. There was the institutional requirement to be a service provider to increasing numbers of doctoral students, versus the desire to provide a truly individual educational opportunity. Quality assurance procedures put focus on the functional approach, and this study demonstrates that narrowing the focus without theorising it risks limiting the student experience. There is a disciplinary requirement to adhere to the standards required, and a personal desire to ensure that the student is successful, and there is sometimes a tension between the academic's own career advancement and that of the student.

The tensions between dependence and independence have been illustrated in each of the conceptual approaches discussed, and are summarised in Table 2.

The impact of the supervisor's own experiences when they were a PhD student

When the interviewees were asked about their own experiences as a PhD student, there was a noticeable change in behaviour. All became more expansive, and the approaches they described are marked in italics in Table 4. Some relaxed and described intensely positive relationships; some described deeply unhappy experiences (marked in Table 4 with an 'O'). This supports the findings of Delamont, Atkinson, and Parry, where their interviewees talked about the strong influence of their days as a PhD student on their own supervision (Delamont, Atkinson, and Parry 2000, ch. 8).

Frequently an interviewee in this study described a way that their experience had informed their current practice. Supervisors would seek to emulate, add to or avoid their own experience. Some examples are in included Table 3.

Table 2. Concepts of supervision compared with dependence and independence.

	PROFESSIONAL ROLE ◄——► PERSONAL SELF				
	Functional	Enculturation	Critical thinking	Emancipation	Relationship development
DEPENDENCE	Student needs explanation of stages to be followed and direction through them	Student needs to be shown what to do	Student learns the questions to ask, the frameworks to apply	Student seeks affirmation of self-worth	Student seeks approval
INDEPENDENCE	Student can programme own work, follow own timetables competently	Student can follow discipline's epistemological demands independently	Student can critique own work	Student autonomous. Can decide how to be, where to go, what to do, where to find information	Student demonstrates appropriate reciprocity and has power to withdraw

The impact of that formative experience was felt particularly strongly in one or two approaches, not across the board (this is shown in italics in Table 4). However, supervisors reported expertise and practice in more approaches than this.

The distribution of exµperience across categories

It would take a wider research approach to begin to untangle these layers, but when interviewees were shown the list of approaches at the end of the interviews many of them identified themselves quickly as falling into two of the categories (not necessarily the wider span of categories which they had described earlier in the interviews). Most of the interviewees said that they operated in the functional approach plus one other.

Current students also reported a feeling of being supervised predominantly through one or two approaches. Whilst supervisors are flexible, it would be worth investigating whether there is also a theory in use and an espoused theory happening here (Argyris and Schon 1974). Whilst supervisors may be able to demonstrate a range of approaches, they may also have a dominant or default position which is most powerfully experienced by their students.

Conclusion

The impact of these approaches on existing students is worth further research. For example, does an enculturation approach encourage students to stay within the discipline and seek work within academia?

Additional interviews and discussions with groups of PhD students suggested that the five concepts have a face validity with students as well as with supervisors. Further research is needed on this and the proposition that: whilst a supervisor might exemplify a range of conceptual approaches, the student experiences one or two predominant approaches.

A range of methodological approaches is necessary to close the gap between the levels of awareness and action which may be hidden by just interviewing supervisors. Both observation and interviews will only give partial information and both are interpreted through the filter of the researcher/observer. The interviews could not differentiate between the following:

Table 3. Quotations illustrating a comparison of academics experiences as students and as supervisors.

Supervisor's own experience as a PhD student	Current practice as a supervisor
My own PhD was a very lonely experience … at lab meetings it became very evident, he [my supervisor] would show enthusiasm about everyone else's project and not mine	… the second advantage of groups is that everyone knows what is going on … when we have groups I make sure that everyone is included.
The door was always open. He would talk about anything for hours. When I wrote nonsense he asked me to resolve it rather than do it for me.	I ask 'is this consistent with this' and leave it as a question for the student to resolve. I will point out internal inconsistency.
I was happy with my supervision but it was not conventional … my supervisor encouraged me to read widely, to think critically and find examples in newspapers. I did not have to produce a chapter a meeting … everything I wrote was scrutinised, there were 20 comments on every paragraph or page.	I am led by the example of my supervisor, but I would worry if someone did not produce something (in writing) for 2 $^{1}/_{2}$ years. I have seen the advantage of structure and giving deadlines. [This supervisor also showed me the extensive detailed written feedback he gives to his students.]
I would give [my supervisor] drafts of my chapters, sometimes I would just have a moan.	I would like to ask my student 'is there anything I can do to make it easier for you'?
When I joined, my supervisor gave me a book he had just written.	I do the same for my students.
I was enthused by my supervisor.	My students all know their academic grandfather.
My supervisor was very dedicated to the subject. It was hard to talk about anything but the subject.	At the end of the day the student's intellectual development is the most important thing.
I still bear the scars, there was very little supervision or interaction. No mentoring. I had a disengaged supervisor who was unable to understand what my project was about.	I try to get my students to initiate, I tell them 'if I don't see you I am going to fill my time up, I am going to forget about you, so I want you to ask me one question that will tie me back into the project once a week.

Table 4. Distribution of statements relating to concepts.

	Function	Enculturation	Critical thinking	Emancipation	Relationship development
Engineering	XX	XX	X		*X*
Engineering	X	X	X	X	*O*
Science	XXX	*X*	*X*		X
Science	XXX	XXX			*O*
Technology	XX	*XX*			
Computing	X	X	X		*XX*
Sociology				*XX*	*XX*
Psychology	XX	*XX*	X		
Economics			*XX*		X
Philosophy	X		XX	X	*O*
Management studies	X	X	XX	*X*	
Management studies	X			*XX*	*XX*

Key
X Statement of approach clearly attributable to this category.
O Negative experience as a student.
X Positive experience of category as a student.

(1) What I say I do (espoused theory);
(2) What I think I do;
(3) What I do in practice (theory in use).

I would like to propose that the concepts be further explored in terms of their advantages and disadvantages for students and supervisors. An initial analysis suggests the issues raised in Table 5.

The strong implication of this article is that supervisors who are aware of the strengths and weaknesses of all of these approaches to supervision will be better placed to develop their skills and enjoy the undoubted rewards brought by working with PhD students.

Table 5. Advantages and disadvantages of different conceptual approaches to doctoral supervision.

	Functional	Enculturation	Critical thinking	Emancipation	Relationship
Advantages	Clarity Consistency Progress can be monitored	Encourages standards, participation, identity, community formation	Rational inquiry, fallacy exposed	Personal growth, ability to cope with change	Lifelong working partnerships. Enhanced self-esteem
Disadvantages	Rigidity when confronted with the creation of original knowledge	Low tolerance of internal difference, sexist, ethnicised regulation (Cousin and Deepwell 2005)	Denial of creativity, can belittle or depersonalise student	Toxic mentoring (Darling 1985) where tutor abuses power	Potential for harassment, abandonment or rejection

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