

Patterns of practice in South African doctoral education: an empirical study

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In South Africa, doctoral education is usually organised in a traditional supervision model, but the practice of supervision differs across academic units and supervisors. In her comparison of PhD experiences in British universities, Chiang identified two research training structures, namely teamwork and individualist. These different structures affected the research environment, the relationships between supervisor and supervisee, and the experience of doctoral study. Can such differences be observed in South African universities? In a qualitative study of four academic units from different disciplines, four patterns of practice were detected in the ways in which doctoral supervision and research activities were organised. This article characterises these patterns of practice and discusses their impact on the doctoral experience.

Praktykspatrone in Suid-Afrikaanse doktorale studieleiding

In Suid-Afrika word doktorale studieleiding meestal volgens die tradisionele studieleidingmodel georganiseer, maar die toepassing daarvan verskil tussen akademiese eenhede en studieleiers. In haar vergelyking van PhD-ervaringe by Britse universiteite het Chiang spanwerk en individuele werk as twee verskillende navorsingsopleidingsstrukture geïdentifiseer. Hierdie strukture het die navorsingsomgewing, verhoudings tussen studieleiers en kandidate, sowel as die doktorale studie-ervaring beïnvloed. Kan soortgelyke verskille by Suid-Afrikaanse universiteite waargeneem word? In 'n kwalitatiewe studie van vier akademiese eenhede in verskillende dissiplines is vier praktykspatrone geïdentifiseer waarvolgens doktorale studies en navorsingsaktiwiteite georganiseer word. In hierdie artikel word die verskillende praktykspatrone omskryf en hul invloed op die doktorale studie-ervaring bespreek.

Dr J Backhouse, Council on Higher Education, P O Box 13354, The Tramshed 0126; E-mail: Backhouse.j@cbe.ac.za



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It has been observed that doctoral education in South Africa follows the “classic British model of supervision” (Dietz *et al* 2006: 9), in which a doctoral candidate works individually on research under the guidance of a supervisor over a long period of time (cf also Mouton 2001, Szanton & Manyika 2002).¹ However, the practice of supervision differs across academic units and supervisors, and a discussion of doctoral education in terms of overarching models “obscures important features and histories of the systems or programmes in which they are situated” (Pearson 2005: 123). Differences in the actual practice of doctoral education lie in the details of supervision arrangements; the nature and focus of structured activities, including the use of cohorts; the degree to which candidates have opportunities to collaborate and interact regarding their work, and differences in the nature of knowledge and knowledge generation in the disciplines. If we are to fully understand doctoral education in South Africa, we need more nuanced models that illuminate, rather than obscure, the detail of how doctoral education takes place.

Chiang (2003) compared the experiences of doctoral candidates in chemistry and education departments in British universities and identified two research training structures. The teamwork structure, observed in chemistry departments, is one in which “doctoral students and their supervisors work on the same research projects” (Chiang 2003: 17) as junior but full members of a research team. The individualist research structure, found in education departments, is one in which PhD candidates work in isolation on their own projects, unrelated to the research in which the supervisor is engaged.

These different structures were found to influence the research environment, the relationships between supervisor and supervisee, and the experience of doctoral study. For example, in the teamwork structure, research topics are often allocated by the supervisor as part of a larger research project; PhD candidates work in a research team which includes senior and junior staff and post-doctorates, and all

1 This article is based on and includes excerpts from my PhD thesis (Backhouse 2009). An early version of this article was presented at the Postgraduate Supervision Conference: Research & Practice held in Stellenbosch, 27-30 April 2009.

members of the team share resources. By contrast, in the individualist structure, PhD candidates are expected to select their own research topics; they are not regarded as members of the research community, and they work in isolation with access to fewer resources. Chiang related the different research training structures to the nature of knowledge and the processes of knowledge generation in the different disciplines. Knowledge in chemistry is cumulative and requires convergent thinking and collaboration, while education “calls for a divergent way of thinking to progress itself” (Chiang 2003: 19).

Can similar structures be observed across disciplines in South African universities? If so, what are they and what gives rise to them?

In a qualitative study of four academic units, representing different disciplines, at three South African universities, the dominant model of doctoral education was subjected to closer scrutiny. While all four case studies made use of traditional supervision relationships, there was considerable variety in the detail of how doctoral education was organised and carried out. Four patterns of practice were detected in the ways in which doctoral supervision and research were organised. However, the practices were less clearly associated with disciplines and less uniform than Chiang’s research training structures. This article reports on the different patterns of practice that were observed and how these relate to the disciplines.

1. About this study

The challenge when researching doctoral education is that it varies between universities, faculties, departments and even supervisors. It is difficult to find a typical doctoral programme to study. In addition, because doctoral education is concerned with generating knowledge, it differs across disciplines with their different understandings of knowledge, tools and techniques for conducting research, and ways of structuring social relations (cf Becher & Trowler 2001). The personal nature of the relationship between supervisor and supervisee also means that the practice of doctoral education differs by supervisor, and the experience by supervisee. A research design was sought that would enable an examination of the practice and experience of groups of individuals,

with sufficient commonality between them, to allow comparison and discern patterns as well as examination of disciplines.

A multiple-case study research design based on qualitative case studies of four academic units is used.² Yin (1994) characterised case studies as empirical enquiry that investigates a contemporary phenomenon within its real-life context and argued that they are appropriate when investigating complex social phenomena, particularly when the boundaries between phenomenon and context are not clearly evident and when the researcher cannot control events. In doctoral education, the context is an inextricable part of the process, and there would be little opportunity for a researcher to control events. A multiple-case study design would allow for comparisons across disciplines.

Case studies can employ multiple levels of analysis within a single study (cf Eisenhardt 1989, Yin 1994) and it was found necessary to consider both the doctoral programme within the academic unit, and the individual supervisors and doctoral candidates, as units of analysis for this study. Examining the doctoral programme enabled the researcher to draw conclusions about the rules that frame doctoral education and the expectations and practices at the level of the academic unit, while analysis at the level of the supervisor and doctoral candidate would highlight the expectations and practices of the individual and facilitate comparison within the unit.

Each academic unit provided an opportunity to engage with a group of supervisors and supervisees who were working on research that had (at least some) similar characteristics, and practising doctoral education within a common set of institutional and faculty rules, while the selection of the four case studies allowed for comparison across disciplines. The choice of case studies was based on theory to represent disciplines in Becher's four quadrants of hard/soft and pure/applied disciplines. Academic units running doctoral programmes were selected where the form of the programme had not changed substantially in the past two years; had more than five currently enrolled

2 The term unit denotes what is sometimes called a department and sometimes a school, depending on particular university structures and naming conventions.

PhD candidates, and had graduated at least five people since 2000.³ Access also influenced the final choice of academic units.

Yin (1994) warns against making a programme the unit of analysis because of the difficulty of delineating the boundaries of a programme. It was found that the boundaries between the programme and the environment were blurred. Two, overlapping, working definitions were agreed on. The doctoral programme for the academic unit would include the procedures, people and activities, both in and outside the unit, that were concerned with facilitating doctoral study within the school or department. The doctoral programme for the individual PhD candidate would include those people, situations and activities that were encountered during their studies as a result of having enrolled for the PhD.

Documents were examined, interactions were observed and interviews were conducted. All the doctoral candidates and supervisors in each case study were invited to participate and all those who agreed were interviewed. In total 64 interviews were conducted, of which 38 with supervisors and 26 with doctoral candidates. Interviews were semi-structured and lasted between 50 and 90 minutes. Among other things, the interview interrogated the structure and process of the PhD, the supervision relationship and other formal and informal ways of learning, and the experience of doctoral study. The data collection took place between March 2007 and November 2007. In this article data are referenced by case study code (Mathematics – CM, English Studies – KE, Civil and Environmental Engineering – WC, and Public and Development Management – WP), an indicator of the type of data (Interview – I, Documents – D and observations – O),⁴ a unique number and a paragraph number or range. Thus KEI22:195 refers to paragraph 195 in the 22nd interview in the English studies case.

3 While this might appear from the perspective of some disciplines to be a small number, from the perspective of others, it is not. Success was not measured in terms of numbers of graduates, as much as in terms of steady production.

4 In some cases a code T is used in interviews in order to prevent cross-referencing of quotations that might compromise anonymity. The full details of this coding are explained in Backhouse 2009.

2. The four academic units

The four academic units selected were a department of Mathematics and Applied Mathematics, a school of Civil and Environmental Engineering, a department of English Studies, and a Graduate School of Public and Development Management. These are situated in three South African, traditionally English-speaking, universities which are considered among the top five research institutions in the country. Some of the characteristics of doctoral education within each academic unit will now be described.

2.1 Mathematics and Applied Mathematics

The Department of Mathematics and Applied Mathematics is a large department, with forty-eight permanent academic staff, thirteen support staff and various visiting scholars. At the time of the study twenty-three people were registered for PhDs. The department is home to numerous research groups consisting of staff members and postgraduates.⁵ Research groups have different levels of funding, different social practices and different approaches to pedagogy. This means that the PhD experience depends to a large extent on which research group one is in. Nevertheless, the majority of the PhD research work is carried out alone, or in one-on-one consultation with the supervisor. In some research groups, candidates work on related projects and may be working for an external client.

A proposal is produced for registration which is often fairly short and may be written by the supervisor who often determines the initial problems that will be worked on (CMI01, CMI04, CMI1,;CMI19, CMI22). Respondents explained that, for mathematicians, it is often not possible to say in advance what problems will be solved and the difficulty of evaluating proposals which are incomprehensible to all but a small group of experts makes the proposal a less significant part of doctoral studies (CMI02, CMI03, CMI13, CMI14, CMI15, CMI17, CMI22). However, a more substantial research proposal is produced in research groups where projects are more amenable to planning.

5 These may include master's, doctoral and post-doctoral candidates.

According to both supervisors and PhD candidates, supervision meetings normally take place once a week for approximately an hour, but some meet more frequently and those who are further in their studies or who are co-supervised may meet less often (CMI03, CMI10, CMI12, CMI18, CMI19). Depending on the research group and individual needs, students may be expected to attend doctoral seminars, honours or masters level courses, research seminars, and workshops or conferences. In some specialities PhD candidates publish papers during their candidature (CMI03, CMI05, CMI07, CMI12, CMI22), but in others the thesis “is in some senses a big paper” and is published on completion (CMI23:87, CMI03, CMI17).

The majority of the PhD candidates in Mathematics and Applied Mathematics study full-time. Some tutor or lecture in order to supplement fellowships and bursaries, and a few are employed as researchers. Full-time PhD candidates occupy shared offices on the top floor and in the basement of the Mathematics building. Their offices are generally not near those of their supervisors, but are grouped together with those of other postgraduates. The environment appears immersive in that doctoral candidates participate in a wide range of the activities of working mathematicians and get exposed to many aspects of the academic world. They confirm this impression, complaining that at the PhD level, they also become exposed to the complexities of departmental politics (CMI05, CMI06, CMI08, CMI13, CMI14).

2.2 English Studies

By contrast, doctoral work in English is generally “a lonely process” (KEI06: 32, also KEI01, KEI05, KEI08, KEI09, KEI10, KEI11, KEI13). One PhD candidate mentions that she has “absolutely no idea” who the other doctoral candidates in the department are, “they come and go, they’re like ghosts” (KEI06: 61).

The Department of English Studies falls within the School of Literary Studies, Media and Creative Arts. It comprises twenty-three academic staff and two administrators. The names of fourteen students registered for doctoral study were provided, of whom three were members of staff. Those doing PhDs in English tend to be either

“on the staff as junior lecturers or tutors, or contracts and they’re trying to get into the field” (KEI08: 21), or they are employed in schools or other educational institutions. Some study from a distance. Some have access to NRF funds which “are for full-time study but they’re not enough” (KEI09: 267). Nearly all PhD candidates have some kind of employment.

Preparing the proposal is expected to take approximately six months but may take up to a year. Supervisors feel that regular supervision meetings are important but their frequency varies from every one or two months to “at least every six months” (KEI05: 68, also KEI02, KEI08, KEI11, KEI13). This may be “every other week” (KEI05: 68) during the final stages of writing or very infrequently for those who are supervised at a distance. Supervision meetings often take place at the supervisor’s home or over the weekend. In addition to supervisors, librarians and archivists play an important role for those doing PhDs in English Studies. They must travel to access specific texts or better stocked libraries (KEI02, KEI03, KEI05, KEI06, KEI09, KEI11).

PhD candidates may be part of a reading group or attend project meetings “if they’re on a grant from a project” (KEI05: 64) and the faculty research office runs an annual two-day postgraduate conference. The department had “until the recent past, a seminar in which postgrads gave papers” (KEI01: 65) but “that just fell away” and other interdisciplinary initiatives also “ran out of steam” (KEI02: 145, 149). Supervisors state that these arrangements are not sustainable because staff are overwhelmed with administrative work and postgraduates lack the drive to run them (KEI08). Doctoral candidates are invited to attend weekly department research seminars, but few do (KEI04, KEI05, KEI06, KEI08, KEI10, KEI11, KEI12).

2.3 Civil and Environmental Engineering

The School of Civil and Environmental Engineering was the smallest of the case studies with fifteen full-time academic staff and “eight full-time PhD students [...] and probably another eight part-timers” (WCI08: 23). There is one administrator and a number of technical staff who support the laboratories. It is home to five research groups

and, as with the Mathematics and Applied Mathematics case, the experience of the doctorate in this school depends on the research group. Some groups are larger and more active than others.

Some candidates in Civil and Environmental Engineering study part-time and others full-time. Full-time doctoral candidates share offices that are interspersed between staff offices. Those studying part-time are employed in positions that relate to their studies and spend little time at the university. PhD candidates who are not in full-time employment mention that they choose supervisors who can provide funding (WCI01, WCI05, WCI09). Funds are obtained from the National Research Fund (NRF), bursaries and scholarships or research contracts. In return, postgraduates assist in “tutorials and laboratory demonstrations and one thing or another” (WCI08: 105). A supervisor states that “most PhD’s in Engineering are funded through contracts that supervisors bring in” (WCI05: 27) and the school website suggests that NRF funding can be topped up “from industry funding”. Sometimes candidates take on consulting work to supplement their income (WCT10, WCI09).

The PhD begins with a proposal that takes “less than a month” or approximately six weeks to produce (WCI01, WCI02). Sample proposals ranged from ten to sixteen pages. Writing the proposal is “quite quick” (WCI02: 151) and “it was very easy from literature review just to put what was actually a gap and [...] what to put there” (WCI03: 93). There were technical problems, “I didn’t understand [what] the Green element was” (WCT05: 87), that were relatively easy to deal with. In addition, while the relationship with outside clients is financially beneficial, supervisors complain that doctoral candidates do not get to craft their own research questions and do consulting work (WCI05, WCI07, WCI09, WCT01).

In some groups candidates are encouraged to consult the supervisor informally whenever they want to. One supervisor insists on being near his supervisees in order to facilitate this interaction. For those studying part-time, supervision meetings can be infrequent, every “few weeks” (WCI06: 119, also WCI09). One candidate who works in another city, sees her supervisor “once or twice a year” but

keeps in touch by e-mail and has more regular contact with the “co-supervisor that works here” (WCT04: 151).

PhD candidates interact with the academic community. They give advice to master’s students and present their proposals to a departmental committee. Those working on research contracts present their work to external clients or at seminars convened with the private sector. Doctoral seminars and research seminars are not frequently held, and those in full-time employment often do not attend because seminars “clash with either field work or meetings” (WCI04: 131, also WCI10). PhD candidates attend conferences and publish papers, but their involvement is often only within the research group. It is possible to spend two years in the department without knowing who the PhD candidates in other research groups are.

2.4 Public and Development Management

The Graduate School of Public and Development Management employs twenty permanent academic staff and another twenty visiting, honorary or associate academics. These are supported by twenty administrative staff. The doctoral programme is relatively new, producing its first graduates in 2001. I was given a list of thirty-four PhD candidates and seven recent graduates. This school has a more structured approach to doctoral education which includes course work. The school provides a comprehensive “Handbook for P&DM Research Degrees” which describes the doctoral study process in terms of six stages: application, preparation, candidature, submission, examination and graduation. This process brings PhD candidates into contact with a range of staff both before and after they begin working on an individual basis with a supervisor.

During the preparation stage, doctoral candidates complete a social theory course in which they are exposed to a range of theoretical positions and research approaches and they draft a short proposal. This course was developed “because our students are not traditional students” and they needed to develop scholarship (WPI04: 93-5). A supervisor describes it as “a PhD preparation course” (WPI14: 35). Since it has not been possible to register the course at the PhD level, it is completed before registering for the PhD. According to some

sources, attendance is compulsory (WPD03, WPI05), but the departmental website is a little more vague, saying that there is an “attendance requirement that may include prerequisite courses (depending upon your background).” One supervisor tries to ensure that his supervisees do not attend. He is critical of the content and the way the process distances the supervisor from the proposal (WPT08, WPD07). However, most people who completed the course valued it and it is now being offered to doctoral candidates across the faculty.

After completing the social theory course, work begins on a long proposal. A committee within the school evaluates both the short and the long proposal, and the latter is submitted to the faculty higher degrees committee for formal acceptance and admission to candidature. When the thesis is ready for submission, it is defended and approved by a submissions committee within the school before submission to the faculty office for examination. These committees appear to have been useful in reducing the number of proposals rejected by the higher degrees committee and in improving the quality of theses submitted (WPI04, WPI14).

According to the handbook, there should be a minimum of six supervision meetings or thirty contact hours a year (WPD03). Since each supervisor supervises many postgraduates, most of whom are in full-time employment, they make use of e-mail and telephone calls to stay in touch and meet when requested. When it is urgent they meet “thrice a month” (WPI09: 99) or “once a month” (WPI05: 47). The departmental handbook makes it clear that supervisors cannot be expected to “be available 24 hours a day” (WPD03: 9).

Most of the doctoral candidates in this school are employed in the public and non-profit sectors. Those who study full-time tend to be foreigners and self-funded, often through consulting work, and one through a larger funded project at the university where he was employed. They share a large, somewhat bleak office in a building some distance away from the staff offices and (because the school offers no undergraduate courses) they do not participate in teaching at the school.

2.5 Comparing the case studies

The differences across the cases can be summarised as follows:

	Mathematics and Applied Mathematics	English Studies	Civil and Environmental Engineering	Public and Development Management
Mode of study	Predominantly full-time	Predominantly part-time	About half full-time and half part-time	Predominantly part-time
How do candidates fund their PhD studies	NRF, DST, bursaries and scholarships, part-time employment	NRF, bursaries and scholarships and full-time employment	NRF, bursaries and scholarships, contract research, full-time employment, short-term contract employment	Full-time employment, short-term contract employment
Research proposal	One or two paragraphs, indicating area. Often written by the supervisor. More substantial in some research groups.	About 10 pages. Comprehensive guidelines give structure. Circulated to department.	Short proposal, an administrative requirement. Often developed by supervisor for funding. Presented to committee.	Short proposal developed during the social theory course. Long proposal developed with supervisor. Both presented to a committee.
Supervision meetings	Approximately once a week.	Every one or two months.	Every few weeks.	Six meetings a year, or more. Regular contact by telephone and e-mail
Engagement with the department	Depending on the research group and individual needs. Tutoring, doctoral and research seminars, courses, workshops, publications.	Little contact beyond supervisor. Occasional seminars.	Regular contact with research group. Tutoring and other duties (if full-time). Seminars, conferences and publications.	Social theory and research course. Individuals may be asked to attend specific courses.

3. Four patterns of practice

Four patterns of practice were detected in the ways in which doctoral supervision and research activities were organised. The practices were not as uniform as Chiang's research training structures, both within and across cases. The patterns are characterised by the degree to which the research is independent or part of a larger project, by the opportunities for interaction with other PhD candidates and academic staff, and by the nature of those interactions.

Chiang's individualist structure was evident in all these case studies, with individuals working on their own research in isolation. However, two variants on the individualist structure were identified, namely networked and loose cohort. There were no examples of the teamwork structure. However, a variant of this structure, which I call the *small team*, was observed in three of the cases. I prefer to call these variants of Chiang's research structures, patterns of practice as they are not sufficiently fixed to warrant the term structure.

3.1 Individualist

Across all four case studies there were examples of candidates working on their own research, unrelated to the research of their supervisor, and working mostly alone. In this pattern, candidates interacted almost exclusively with the supervisor when it came to discussing their research. They had little opportunity structured into the doctoral programme to consult others about their research. There were also few other structured opportunities for them to interact with other people on a social basis.

This pattern resulted in a high degree of dependence on the supervisor for intellectual engagement, guidance, and support in negotiating the day-to-day questions of how to be a postgraduate. In many cases, this coincided with a dependence on the supervisor for funding. The experience was positive for those whose supervisor was supportive, or who had other resources outside the university on which they could draw for support. Part-time students relied on contacts at work, others relied on friends and family networks for this kind of support. However, when the supervisor was less supportive

and candidates lacked their own networks, the individual pattern resulted in a lonely and unhappy experience.

3.2 Networked

The first variant on the individualist pattern is the networked pattern where candidates work on individual projects in a one-on-one relationship with their supervisors, but are part of a research group that includes other staff, postdoctoral and doctoral candidates. Those in the research group work in the same knowledge area or specialism, convene and attend seminars and workshops together, present their work to each other, consult each other on their research, and critique each other's work. Often "there are group meetings within groups" where "all the students supervised by one guy, or by two guys, get together and discuss what they will be doing" (CMI13: 135).

The networked pattern resembles Chiang's teamwork structure in that candidates interact with a range of other staff and students and are familiar with the research in which others in the team are engaged, but it is better characterised as individualist because doctoral candidates work on individual, unrelated projects. A supervisor explains: "Take, for example, the gravity group. My student works on stuff that's very, very theoretical. She has other students in the office that are working on observational stuff" (CMI03: 88). A PhD candidate mentions "at some points we do talk about work, but at the moment we're each doing different things" (CMI14: 199).

This pattern provides opportunities for PhD candidates to interact with their peers and other members of staff, providing a supportive network which may counter some of the isolation of the individualist structure. They can get help from a range of people and are less dependent on their supervisors. For example, a PhD candidate mentions the following of the postdocs in his research group, "they wouldn't mind helping you debug your code or check your equation" (CMI05: 35). A supervisor says of his own doctoral experience:

I did my PhD in, and they put the PhD students in one big room, it was on top of the building. So there was about twenty of us in there, and that was very useful for interacting. I mean, I never asked my supervisor the sort of questions I get here like, 'How do I

use this package?’ It would not have occurred to us. You would just ask someone who’s been using it in the group (CMI12: 219).

Networked patterns were observed in Mathematics and Applied Mathematics and in the Civil and Environmental Engineering instances. They were also evident to some extent in Public and Development Management where one person mentioned: “We are a number of people supervised by the same person, [...] sometimes he calls us together and we discuss issues as a group; not specific to the research, but general” (WPI10: 137).

3.3 Loose cohort

The second variant, the loose cohort pattern was observed in Public and Development Management where candidates work as part of a cohort which meets infrequently, while doing unrelated individual research projects with their supervisors. Members of the cohort attend a social theory course together in their first year, but go on to work on individual research projects with their supervisors from the second year. PhD candidates are exposed to a range of staff members in the initial course whom they can subsequently approach for assistance. In addition, structured elements of the programme, including committee reviews of proposals and submissions, mean that a wider range of staff have input into the work.

Candidates begin their doctoral studies as part of a cohort and this facilitates peer relationships. However, these are generally not engagements regarding research. People exchange telephone numbers and some of them have “drifted into friendships” (WPI06: 305). They get in touch “to say ‘Ah, how is it going with your studies?’ But we don’t actually discuss about the work at all” (WPI02: 170). It appears that the loose cohort pattern does not result in the supportive research networks observed in the networked pattern. PhD candidates are to a large extent “left on their own” (WPI04: 213) and when asked whom he discusses his work with, one man says “right now I’m interacting with myself” (WPI03: 123). From the second year, the experience is similar to the individualist pattern.

3.4 Small team

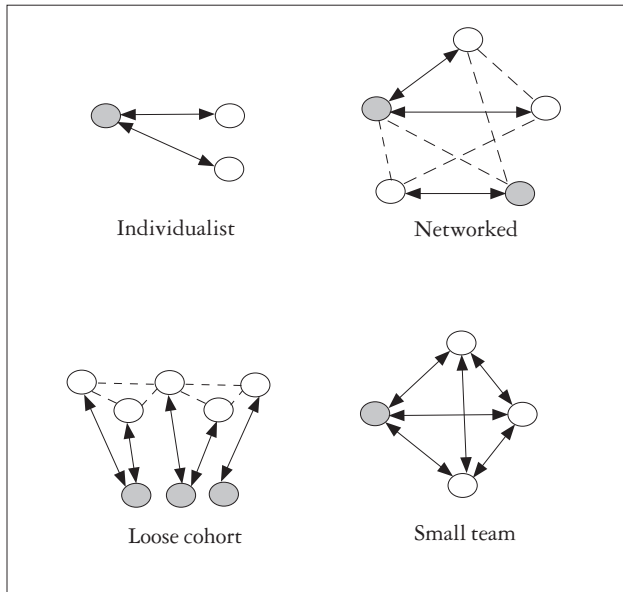
There were no examples of Chiang's teamwork structure in this study. The closest resemblance was to be found in what is called the small team which consists of a single supervisor working with two or three people at master's, doctorate or post-doctorate level on assigned parts of a larger research project. Research topics are assigned to PhD candidates and are often related parts of a larger research project. Candidates work as part of a team, engaging frequently with peers, the supervisor, and often the client, concerning their work and related matters. Those working in this pattern enjoyed their work, had better access to resources and were less likely to complain about being lonely or isolated.

The small-team pattern appears to be a direct consequence of how doctoral studies are funded. In Civil Engineering, for example, PhD study is "funded through contracts that supervisors bring in" (WCI05: 27). It appears to arise when one strong researcher can attract funding for a substantial research project. The small-team pattern was observed in Civil and Environmental Engineering and in one of the research groups in Mathematics and Applied Mathematics. Somewhat unexpectedly, a supervisor in English Studies suggested that this kind of funding was increasing for master's study and "so we're really at a point of change in that, and I think it's going to have to come with doctoral work as well" (KEI10: 30, also KEI05).

3.5 Patterns of practice

Three issues characterise these patterns of doctoral education practice: the degree to which the research done relates to the research that the supervisor does; the degree to which the programme structure facilitates multiple relationships that are centered on the research work, and the way in which the programme structure facilitates other supportive relationships. The different patterns can be represented visually in the following diagrams, where the solid and empty circles represent supervisors and doctoral candidates respectively, the solid lines represent relationships of shared research and the broken lines represent ongoing supportive relationships, not necessarily related to research.

Figure 1: Patterns of doctoral education practice observed in the study



Different patterns of practice provided varying levels of support and access to other people. In the individualist, networked and loose cohort patterns candidates worked on projects independent to the research in which their supervisors were engaged, although in the networked case, the work was often within the same area of specialisation. The individualist pattern made the PhD candidate almost exclusively dependent on the supervisor. The networked pattern provided social support and support in some of the peripheral aspects of doing research, such as getting software to work. The loose cohort provided social support, but candidates met too infrequently and their work was too divergent to engage regarding their research. Only the small-team pattern, in which candidates worked on related research projects, seemed to facilitate engagement concerning

research while providing social and peripheral support, making the PhD candidate least dependent on the supervisor.

Unlike in Chiang’s study where the research structures were clearly related to the discipline, in this study there was no clear relationship between discipline and patterns of supervision practice. Table 3 summarises in which academic units the different patterns were observed.

Table 3: The use of patterns of doctoral education practice in the case studies

	Mathematics and Applied Mathematics	English Studies	Civil and Environmental Engineering	Public and Development Management
Individualist	frequent	dominant	frequent	occasional
Networked	frequent	not observed	occasional	occasional
Loose cohort	not observed	not observed	not observed	dominant
Small team	occasional	not observed	frequent	not observed

Which patterns of practice are used in an academic unit appears to relate to funding models, as observed in the case of the small team, and to the number of people working in a particular area. The loose cohort arrangement in Public and Development Management was set up in response to growing enrolments while supervisors in other units mention, “I don’t have a big group, so it is pretty isolated stuff. In the long run, if I get in more students, they probably will be working on related topics” (CMI09: 176) and “If you’ve got a lot of students in your group, then they can interact more” (CMI12: 105).

Chiang (2003) observed that people working in the teamwork structure had more frequent interactions with their supervisors than did those in the individualist structures. In this study the frequency of meetings with supervisors was not related to whether they worked on individual research or not, rather it appeared to be based on departmental expectations and supervision workloads. Candidates in Mathematics and in Civil Engineering have more frequent interaction with their supervisors regardless of which pattern was in operation. Those in Public Management, where the supervision

workloads are high, and those in English Studies, had less frequent interaction with their supervisors.

3.6 A note on co-supervision

Co-supervision, which replaces the individual supervisor by two or more supervisors, was employed in all four patterns. This arrangement was used when the project spanned two or more knowledge areas and each supervisor provided expertise in a different area, or where one person could contribute specialist knowledge, but could not supervise because they did not themselves have a PhD. A co-supervisor was often based in the workplace with the main supervisor in the university. It was also used as a form of supervision training where a less experienced supervisor co-supervised with a more experienced one.

One of the benefits of co-supervision is that the PhD candidates can draw on two supervisors, thus increasing the resources available to them. One doctoral candidate opted for a co-supervisor “because I wanted some balance [...] he could push a bit too hard” (CMI04: 163) and a supervisor explains that the arrangement can be supportive:

I think it's quite healthy for a student to have two supervisors actually, particularly because some of them [...] need a bit more mentoring. [...] While I'm critical of their work, I always try to be supportive as well and tell them, 'You're doing great'; whereas the co-supervisor [...] is much more matter-of-fact, and sits down and says, 'Right, this is what I think you should be doing.' [...] So, that balance has been good (CMI22: 99).

Co-supervision was used in all the cases except English Studies where a supervisor mentioned that “co-supervision is always very, very difficult, from what I've heard” (KEI09: 191). This reluctance to co-supervise might reflect the highly conflicted nature of knowledge in English Studies (Graff 2006: 371).

3.7 Student initiatives

In categorising the patterns of practice the focus was on the ways in which the academic unit structured the doctoral programme and the consequences for doctoral candidates. However, in two cases,

doctoral candidates were initiating their own networked pattern in order to create opportunities to engage with other people who were working in related areas of research.

A few full-time PhD candidates in Public and Development Management set up an informal forum which met “to discuss our research, the progress and to seek criticism from each other [...] even those that are ahead of us, those who are collecting their data or writing up their work, we try to seek their counsel” (WPI10: 101-5, also WPI08). One candidate explained the benefit:

... it was fascinating to look at how another person interpreted your work and that prompted me into thinking, ‘You know what? I actually need to interact more, because that’s actually the public out there and that’s their interpretation of my work.’ It’s only going to add value. And also my interpretation of their work (WPI07: 225).

Individuals in English Studies had initiated their own networks, in this case outside the university. A supervisor who recently completed her PhD mentions that because “I was going to conferences and publishing articles and involved in an academic community, it wasn’t as lonely as it could have been” (KET03: 215) and another PhD candidate states that he deliberately attends conferences and does a lot of “networking” (KET12: 86).

These initiatives allow PhD candidates to enjoy social support and to discuss their work with others working in similar areas. This makes them less dependent on the supervisor and counteracts the loneliness of the individualist model of doctoral education.

5. Conclusion

These observations of the practice of doctoral education confirm that while individual supervision dominates in South Africa, there are discernable patterns in the specific practice across academic units and supervisors. Four different patterns of practice were identified – the individualist, the networked, the loose cohort and the small team – characterised by the degree to which the research is independent or part of a larger project, by the opportunities for interaction with other PhD candidates and academic staff, and by the extent to which

these interactions were related to the research being done. These different patterns provide different kinds of support for the PhD candidate and result in different levels of dependency on the supervisor. Where doctoral candidates had opportunities to interact with more people and where this interaction centred on their research they were less isolated and felt better supported.

Which patterns were observed in the academic units appears to depend less on the discipline and to relate more to the way in which doctoral study is funded, to the number of research students in the academic unit, and to the workloads of supervisors. A better understanding of the conditions that give rise to the different patterns and the resultant experience of doctoral education will assist in designing further interventions to improve doctoral education.

Some doctoral candidates recognised the limitations of the individualist and loose cohort models and initiated their own networks with people who worked in similar research areas, outside the academic programme structure. Szanton & Manyika (2002) make the point that individual supervision makes doctoral programmes possible in small academic units, where academics are working in isolation and where there are few doctoral candidates. This is the case in many South African universities. Cultivating the initiatives of individuals to create their own networks could supplement the traditional individualist model and relieve some of the isolation associated therewith.

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