The representatives also replied promptly and in detail when Peter Meissner from the University of Cape Town need to know what the other HEIs requirements were regarding submitting a plagiarism report (Turnitin or equivalent) with a dissertation, or thesis.

The spontaneous authentic interacting that developed among the representatives assisted these two colleagues to draft informed policies. In addition, the collection of information was archived in the Forums shared online resources centre. The complementary approach, rather than a competitive approach, that developed during the October meeting is a true manifestation of CI.

CI is a slow process. Participative and bottom-up processes opt for increased participation and invite input and feedback that makes the process complex and continually disrupts the orderliness of the process. However, the measure in which interested individuals become participants and then take ownership is evidence that this approach is establishing a solid foundation for an interest group that will soon have the representation and authority to develop into a more formal body.

The documentation of the establishment and development of the Postgraduate Forum for Southern Africa is an ongoing process, especially in the ever-changing landscape of postgraduate support and its challenges.

References

ACGR. (2015). Resources. Available at http://www.ddogs.edu.au.

Altbach, P. G., Gumport, P. J. & Berdahl, R. O. (2011). American higher education in the twenty-first century: Social, political, and economic challenges. Baltimore: John Hopkins University Press.

Bartelse, J. & Goedegebuure, L. (1999). Institutional change in doctoral education: The graduate school. In Ben Jongbloed & Peter Maassen (Eds.) From the eye of the storm: Higher education's Changing Institution. Dortrecht: Kluwer.

Bahm, A. J. (1982). Creative impersonality. In J. A. Broyer, W. S. Minor, & H. Nelson. (Eds). Creative Interchange. (pp. 328-337). Carbondale: Southern Illinois University Press.

Broyer, J. & Minor, W. (2006). Creative Interchange. Carbondale: Southern Illinois University Press.

David, K. R. (1985). Theology and Empiricism - An interface. Journal of Thought, 20, 2, 104-112. Available at http://www.jstor.org/stable/42589113.

Gadamer, H. G. (2004). Truth and method, 2nd rev. edn, rev. trans. J. Weinsheimer and DG Marshall. London: Continuum.

Hepler, C. L. (1982). Creative naturalism and creative interchange. In J. A. Broyer, W. Minor, S. Wieman & H. Nelson (Eds). Creative Interchange. Carbondale: Southern Illinois University Press.

Kezar, A. (2012). Bottom-up/top-down leadership: Contradiction or hidden phenomenon. The Journal of Higher Education, 83, 5, 725-760. Available at http://eri c.ed.gov/?id=EJ997241.

Leer-Salvesen, K. (1982). Exploitation and Creative Interchange in interchange. In J. A. Broyer, W. S. Minor, & H. Nelson. (Eds) (pp. 340-344). Carbondale, IL: Southern Illinois University Press.

Carroll, L. (1969). Alice in Wonderland. Chicago: Children's Press.

Lischalk, C. (2002). Building Social Capital through Creative Interchange. Palatine, Il: Creative Interchange Institute.

Stuart, P. & Green, H. (2007). The doctorate worldwide. Berkshire: McGraw-Hill.

WHSC. (1969). Report on the Conference on Predoctoral Education in the United States. Washington: NRC.

Miller, D. L. (1986). The experience of creative interchange. American Journal of Theology and Philosophy, 7, 1, 17-27.

Dietz, A. J., Jansen J. D. & Wadee, A. A. (2006). Effective PhD Supervision and Mentorship. Amsterdam: Rozenberg.

UKCGE. (2013). Executive Committee. Available at http://www.ukcge.ac.uk/about-ukcge/ukcge.aspx.

Doctoral Supervision as a Professional Practice?

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Abstract

Contemporary trends in science policy and social theory challenge the concept of doctoral supervision as 'professional practice'. The concept compares supervision with the work of other professionals regarding a specific working alliance. Supervisors and novices engage in a relationship to create and solve an intellectual crisis. The dynamics of the crisis, paradoxes of the situation and technical uncertainties of non-standardised problem solving are typical features of all professional practices. However, worldwide trends in doctoral education such as the improvement of completion rates, the creation of formal organisations and programs as well as the overall 'projectification' of the Ph.D. process tend to ignore the unpredictability of doctoral research and supervision. In consequence, social theory discusses trends towards increasing formal control, disciplinary differentiation and particularities in doctoral supervision as an ongoing 'de-professionalisation' of a shared professional practice. To defend and specify the concept of professional practice for doctoral supervision, I draw on a comparative study of supervision practices in two disciplinary fields (physics and social sciences) and different organisational contexts in the German academic system. I argue that the creation of independent researchers and new knowledge constitute a specific interaction between supervisors and novices beyond disciplinary and organisational differences. Autonomy and dependence, self-learning and guidance, production and solution of intellectual crisis and conflicting role patterns create an inherent tension in supervision practice that cannot be resolved by formal structures and is therefore best described as professional practice.

Keywords

supervision practice, supervisory interaction, professional work, institutional policy, disciplinary diversity

Introduction

Today, most discussions to improve doctoral education and research focus on external regulative structures for the PhD process such as organisation building, techniques of project planning and control or adding coursework and generic knowledge to instruct doctoral students. This new model of 'structured' doctorates is the outcome of worldwide policy discourses. These confront the traditional apprenticeship model with the needs of knowledge societies and economies for higher completion and lower attrition rates as well as more timely, predictable and transparent doctorates (Nerad, 2010). At the same time, the 'structured' approach tends to conceptualize doctoral education as 'technical process' (Connell & Manathunga, 2012) and ignores the complex aims and specific epistemic as well as social dynamics inherent in doctoral research supervision. In most countries it is expected that supervisors and PhD candidates engage in an open-ended relationship in order to advance knowledge and increase the doctoral student's capability to perform as an independent researcher. Simultaneous calls for independence and intervention, new knowledge and robust instructions create a contradictory situation that is best described as an uncertain 'professional practice' with specific properties. This article draws attention to structures inherent in the supervisory situation and the subsequent complex relationship between supervisors and the PhD candidates. In order to do so I use insights from the sociological theory of the professions as well as empirical studies from doctoral education research to conceptualise 'professional practice' for doctoral supervision; respond to profound theoretical criticisms; and provide evidence from supervisory practices in physics and social science within the 'structured' model from an empirical study in the German academic system. I find that that new regulative structures cannot resolve the structural dilemmas that are still prevalent at the heart of doctoral supervision.

What is a professional practice?

In everyday life the meaning of the word 'professional' is opaque. Sometimes it just refers to 'good', 'paid', 'systematic' or 'expert' work. In doctoral education the term professional is often used as a synonym for organizational control or non-academic fields as the notion of 'professional PhD' indicates. In social theory the term 'professional' has a specific meaning. It refers to specific properties of a small group of expert occupations such as law, the medical or academic profession. The first line of reasoning defines professions along institutional criteria such as their important function in society, high value or status and power to define and control the content of their work on the basis of codified knowledge (Abbott, 1988; Freidson, 1986; Larson, 1977; Parsons, 1939). The second, and for my argument more important, line of reasoning draws attention to the occupational practice itself. Professions deal with fundamental personal, normative or intellectual problems and rely therefore on a complex, uncertain and often crisis-prone practice (Hughes, 1971; Marshall, 1939; Oevermann, 1996). Professional practice is defined as a non-routine expert work for several reasons that apply to doctoral supervision as well.

First, professions deal with critical situations of patients, clients or in our case novices who ought to learn how to advance knowledge independently by doing original research for the very first time. Ph.D. students have to solve an intellectual crisis that unleash with unanswered questions and often expand to a personal crisis of self-doubt. Second, professionals and supervisors have a knowledge application problem. They apply theoretical or practical knowledge to particular, new or even unknown cases and situations. The application of theories, methods or techniques does not automatically advance knowledge wherefore success cannot be guaranteed. Third, Ph.D. students cannot entirely delegate their research problems to supervisors. Candidates have to prove whether they are capable to solve and create scientific problems independently. PhD students often know the empirical or experimental results and pitfalls better than supervisors. Fourth, intervention problems arise in professional practices. In doctoral supervision a structural tension between the expectation to instruct and to create independent researchers is essential. If new knowledge is at stake there is typically a lack of instructions. Traditionally, this uncertain, unpredictable and flexible professional practice was organized in an informal way. Professionals and clients or in our case supervisors and novices build a personal working alliance and cooperate towards unspecified goals such as 'advancing knowledge' and 'creating independent scholars' on the basis of implicit knowledge, ethics, norms and role expectations. This traditional concept of 'professional practice' is under attack and in transition worldwide for several reasons. In the following, I respond to main criticisms, draw conclusions for the design of my empirical study of supervision practices and illustrate some essentials of this practice that persist within new formal structures.

Criticisms of the 'professional practice' concept

Critics argue that the notion of 'professional practice' is an ideology to valorise ordinary occupational practices, ignores the disunity of academic disciplines and recent governance changes that result in a de-professionalization or cannot be applied to scientific practice (Table 1). My empirical investigation of supervision practices in Germany responds to four main and longstanding criticisms of the professional practice concept. I briefly summarise the first three criticisms and focus on the last to analyse properties of the working alliance between supervisors and Ph.D. students as a particular professional practice.

The first objection doubts that science and other occupations are organized in different ways. Since the 70s sociology of science claims that every statement on the nature of scientific or in our case supervisory and doctoral research practice has to be assessed on the level of practice (Knorr Cetina, 1981; Latour & Woolgar, 1979). Without such proof, all institutional scripts, organizational rules, theoretical models or statements remain pure 'ideologies'. For this reason, it is important to analyse supervision as a specific social practice (Alison Lee & Boud, 2009) and how it is performed in reality. My study therefore reconstructs the structures at work in supervision practices and draws on data of this practice from two ethnographies in physics and social science graduate schools summarized in Table 2. The sample includes qualitative interviews with supervisors and PhD students as well as site observations and recorded supervisory interactions to overcome the limits of accounts and narratives most studies of supervision build on (Atkinson, Delamont, & Parry, 2003).

The second objection emphasizes the variety of doctoral education across research fields and tends to deny generic structures (Becher & Trowler, 2001; Clark, 1989; Knorr-Cetina, 1999). A disciplinary comparison was necessary in order to seek out overarching structures of doctoral education and research that exist beyond difference (Pearson, Cowan, & Liston, 2009). I compare the highly individualistic and multi-paradigmatic social sciences with the collectivistic and paradigmatic physics. My study includes different forms of team supervision in research groups, one-to-one supervision or peer-to-peer supervision in daily laboratory work. Despite very different contexts and ways to deal with supervision all disciplines struggle with the uncertainties of knowledge production and the support of candidates in becoming independent researchers. It will be shown, that coping with structural tensions and paradoxes is ubiquitous in supervision.

The third objection is central to global science policy discourses. The critics of the old apprenticeship model argue that supervision is not at all a professional practice but rather organized in an amateurish fashion. The shift from a professional to a 'structured' doctorate suggests that the uncertainties of the supervision process can be resolved by formal organisations (Byrne, Jørgensen, & Loukkola, 2013). To tackle these uncertainties, new organisational structures such as graduate schools, selection procedures, supervision agreements, curricula and monitoring systems emerge to enhance, supplement or even replace the apprenticeship model. In my study I compare supervision practices within and without such new organisational forms to measure the impact of this institutional change. A key finding is that the traditional apprenticeship model is still at the heart of the new 'structured'

doctoral education model. For this reason, I draw attention to the properties of the supervisory relationship by describing it as a particular professional working alliance.

The fourth objection doubts the comparability of the professional and supervisory situation because supervisors and candidates engage in an intellectual rather than an acute personal crisis to gain scientific rather than to restore or restrict primary independence. The role relations are also different in doctoral supervision because Ph.D. candidates are future colleagues in the same field of study rather than laymen clients. For this reason, my study considers the similarities and obvious differences to specify doctoral supervision as a particular working alliance.

Doctoral supervision as a specific professional working alliance

In the following, I draw on studies in the field of doctoral education research and on my own investigation to illustrate specific structures of the working alliance in doctoral supervision. Many studies conceptualize doctoral education and research as a process of socialization to the academic profession (Bragg, 1976; Corcoran & Clark, 1984; Gardner & Barnes, 2007; Gardner & Mendoza, 2010; Weidman, Twale, & Stein, 2001) or various disciplines (Golde & Walker, 2006; Parry, 2007). The professional socialization process has been described in terms of a formal 'status passage' accompanied by informal 'rites of passage' (Gennep, 1960; Glaser & Strauss, 2010; Van Maanen, 1978); implicit learning process ('learning by doing') in the course of doing research (Traweek, 1988); and as a demanding supervisory interaction. According to empirical studies, the supervisory interaction builds on structural

TABLE 1: ANALYTICAL RESPONSES TO CRITICISMS OF THE PROFESSIONAL PRACTICE CONCEPT

Criticism	Discourse	Analytical objective	Data
Specific practice?	Ideology critique: Social studies of science	Structures at work in supervision	Ethnographies, recordings of everyday practices, interviews
Uniform practice?	Variety of disciplines: Differentiation theory	Generic structures across research fields	Social sciences and physics
Organized practice?	External control: Governance	Impact of new organizational structures	Supervision practices within different organizations
Professional practice?	scientific vs. professional practice	Specificity of working alliance in supervision	Tape recordings of supervisory interactions

TABLE 2: DATA

Field	Supervisors	PhD students (external)	Interviews	Interactions (group)	Site observations
Social Sciences	15	25 (10)	8	20 (7)	Office, workshops, colloquia, Summerschool
Physics	6	21 (0)	9	20 (6)	Office, laboratory, team meeting, journal club, etc.
Total	**21**	**46 (10)**	**17**	**40 (13)**	

tensions and subsequently calls for 'creating a delicate balance' (Delamont, Parry, & Atkinson, 1998) between conflicting requirements. These include, for example, the emphasis on mutual dependencies and responsibilities (B. Grant & Graham, 1999; B. M. Grant, 2010), the tension between autonomy and intervention or role conflicts inherent to the transitional position of Ph.D. candidates (Gardner, 2008; Anne Lee, 2008). Unfortunately, only a few studies directly link doctoral supervision to the more general concept of professional working alliances (Halse & Bansel, 2012; Halse & Malfroy, 2010). However, these studies do not refer to the underlying theory of professions. According to the theory of professional action the interaction between professionals, clients, patients or in our case novices can be described as a demanding working alliance (Oevermann, 1996). Professionals and patients, clients or novices build a relationship in order to produce the conditions to solve a case specific personal, normative or intellectual problem. For this reason Edward S. Bordin claims in his definition of supervision as a working alliance that the 'building and repair process [of the relationship] is the treatment' (Bordin, 1983). This means in the case of doctoral supervision that the anticipation of the novice role, capabilities to face intellectual problems, to ask for help and to learn how to solve problems independently as well as the search for necessary 'tasks', 'goals' and 'bonds' (ibid.) are part of the relation building process. In this process of 'improvising together' (B. M. Grant, 2010) supervisors and Ph.D. students are interdependent and lack precise role models at the beginning. For example, Ph.D. students have to communicate (typically unclear) research problems in order to get advice and supervisors depend on precise information to give advice. As a consequence, they cooperate to find out possible (and worthwhile) problems as well as solutions before Ph.D. students test the appropriateness of advices in scientific practice. However, linking doctoral supervision to insights from the theory of professions has (at least) three analytical advantages. First, the analysis of doctoral supervision can be used for social theory building. Communalities in doctoral supervision and other professional working alliances would demonstrate against all doubts that science is (still) a profession. Second, comparing doctoral supervision with the working alliance of other professions is useful to specify supervisory relationships. Third, structural properties of professional practice explain why doctoral supervision persists despite far reaching institutional changes in doctoral education.

In the following last section, I draw on my empirical investigation of supervisory relationships and interactions within the new 'structured' doctorate in Germany. I illustrate some structures of doctoral supervision that occur beyond disciplinary or organisational particularities and create a specific working alliance.

Persistence of the supervisory working alliance within new institutional structures. Examples from the German case

The German doctoral education and research system traditionally relies on an individual relationship between powerful supervisors and Ph.D. students, exemplified by the still common term of 'doctoral father/mother' (Green & Lee, 2009). Since 1985, an alternative institutional model of 'structured' doctorates emerged in science policy in order to replace the traditional system. For this reason, formal organisational structures of graduate schools, collective and transparent selection, control and assessment procedures as well as coursework have been introduced. The following examples demonstrate that specific structures of the supervisory relationship persist within this new framework.

Establishing personal relationships

The structured doctorate relies on the idea of shared institutional responsibilities and impersonal organisational structures such as collective selection procedures or formal supervision agreements. However, engaging in a supervision relationship is still a voluntary and personal decision for supervisors and candidates alike. Acceptance or rejections of applications take place in committees, but it is not independent of the advisors or doctoral students. Potential advisors need to be interested in an application, exemplified in the comment by a director of a social sciences graduate school: 'no one would foist just any candidate on a colleague.' The same goes for doctoral candidates who would not be forced into the 'hard, clearly father-son-like relationship that you can't get out of'. Instead, the first year is reserved for finding a supervisor, building and committing to a personal relationship. Supervisors and candidates explain the importance of personal relationships in vary ways. From an institutional perspective they still take the main responsibility in the Ph.D. process; Ph.D. students' careers depend considerably on the support of supervisors and their academic networks; supervisors' motivation to engage in supervision relies on personal relations and/or their benefit of doctoral work; and personal trust is a condition to begin a relationship, whose length of time, topical and social dynamics no one can know in advance. In doctoral supervision personal relationships and responsibilities are even more important than in other professions where a referral to colleagues is usual.

Supervision as co-production of knowledge

One important difference to other professional working alliances is that supervision is not a one-way street. Sometimes it is very explicit that supervision is embedded in working relationships when students are hired to work on their advisor's project or are given a topic to work on. There is also a general assumption that the quality of supervision depends upon the mutual alignment of interests expressed in attempts to outsource, redirect or embed doctoral projects in the research lines of the advisors. A postdoc pointed out the mutual obligations in the supervision process: 'A doctoral student has his own interests, but I also have my interests, I have to see what comes out of it. It's also about me, and about the time that I invest in supervising.' The mutual alignment of research interest is important for supervisors and Ph.D. students to facilitate one's own research. Other professions similarly rely on the activity of patients or clients in order to get important information or to change their situations. But professionals are expected to define appropriate solutions to a given problem, whereas in doctoral education supervisors and doctoral students interact in order to define and resolve problems.

Autonomy as selection criteria and pre-condition for academic work

Unlike client-related professions, where autonomy problems are the reason for initiating a working alliance, scientific independence is an important outcome and a pre-condition as well as selection criteria in academic working alliances

right from the beginning. Ph.D. students are selected based on expected performance independently in scientific practice rather than as dependent 'lab slaves'. One interviewee, an economist states that doctoral students must have learned basic skills already, because 'for a PhD, I look for people that can somehow navigate the chaos of science for themselves.' To form a judgement on the independence of students' advisors still prefer to seek for potential candidates among students or ask colleagues for recommendations.

Voluntary supervision meetings

The principle that preserves independence is voluntary action, and this principle applies to the question of 'who' requests a supervisory meeting as well. In contrast to the expectations in the structured doctorate, advisors express their preference for 'requested consultation' (Engler 2003) rather than requiring a student to come talk to them. Initiative has to come from the doctoral student; otherwise, supervision would cross a tipping point to become a monitoring and control situation. Thus one advisor expressed his reservation to structure the supervision 'more stringently,' because then 'there would naturally be an asymmetry in the way we would be discussing the content.' Instead, there are various ways of making a supervision talk more inviting such as the open door politics of a physics professor: 'the door stays open because I want to invite them rather than sinking in a problem to come to me and say, I don't know what to do. On the other hand, I place great value on not imposing myself on them.' For PhD students it is self-evident that they make appointments after having tried other avenues first. Anything else would be to fail in their obligation to act independently as a doctoral student from astronomy explains: 'I can't just say can we sit two, three hours and every day and work on this, because I am a PhD student. We are supposed to do it on our own.'

Expected independence as an intervention problem

The transitional role of Ph.D. students as future colleagues creates a specific intervention problem in the working alliance. The early anticipation of the colleague role can incite the participants to speak more in terms of success than about doubts: 'Asking for help may be interpreted by students as an inability to do what is expected of them' (Egan, 1989). In my analysis I found many examples in supervisory interactions how supervisors seek and Ph.D. students hide research problems in order to perform as promising colleague, to keep independence and to prevent interventions. These interactions bear a tendency to end up either in pure academic conversations between colleagues with some vague suggestions or run into an unrequested harsh critique of the students' capabilities. Although Ph.D. students may only ask for a solution, acknowledgement or recognition. Finally, strong criticism is the last difference between academic and other professional working alliances. It is an important part of the supervision process to trigger intellectual problems rather than solving them for Ph.D. students in order to ensure timely completion. Such examples demonstrate that structural properties of the supervisory working alliance persist within new ways of organizing doctoral education and research. The smooth functioning of the working alliance in doctoral supervision seems to depend on personal engagement, shared research interests,

autonomy and voluntary action as well as interventions in the intellectual order of PhD students.

Conclusion

This article demonstrates that structural properties of doctoral supervision persist within new organisational forms. I assume, this result is not limited to the German case and has structural causes. The working alliance in doctoral supervision is a particular professional practice that as such can hardly be substituted by formal structures. Follow-up studies need to examine this hypothesis by (a) taking more institutional variations into account, (b) analysing the actual practice of doctoral education and research within new formal structures, (c) investigating impacts and limits of formal organizations in doctoral education and research practice and (d) explaining these in terms of the specific properties of the 'professional practice'. If formal organizations cannot replace this practice a challenging question still remains: What can be done to support the working alliance between supervisors and PhD students? I have no sufficient answer to this question but two general remarks. According to my study, supervisors and Ph.D. students constantly reflect on supervisory relationships but hardly communicate expectations directly. Strategies to foster such a meta-communication between supervisors and candidates might be helpful. My second remark is that PhD students should be better integrated in the everyday research of supervisors in order to build productive working alliances rather than hoarding them in isolated offices and organisations for doctoral education.

References

Abbott, A. D. (1988). The System of Professions: An Essay on the Division of Expert Labor. Chicago: University of Chicago Press.

Atkinson, P., Delamont, S., & Parry, O. (2003). The Doctoral Experience: Taylor & Francis.

Becher, T., & Trowler, P. (2001). Academic Tribes and Territories: Intellectual Enquiry and the Culture of Disciplines. Buckingham: Open University Press.

Bordin, E. S. (1983). A Working Alliance Based Model of Supervision. The Counseling Psychologist, 11(1), 35-42. doi:10.1177/0011000083111007

Bragg, A. K. (1976). The socialization process in higher education. Washington: American Association for Higher Education.

Byrne, J., Jørgensen, T., & Loukkola, T. (2013). Quality Assurance in Doctoral Education – results of the ARDE project. Retrieved from Brussels:

Clark, B. R. (1989). The Academic Life: Small Worlds, Different Worlds. Education Researcher, 18, 4-8.

Connell, R., & Manathunga, C. (2012). On doctoral education: How to supervise a PhD, 1985-2011. Australian Universities' Review, 54(1), 5-9.

Corcoran, M., & Clark, S. M. (1984). Professional Socialization and Contemporary Career Attitudes of Three Faculty Generations. Research in Higher Education, 20(2), 131-153. doi:10.1007/BF00991464

Delamont, S., Parry, O., & Atkinson, P. (1998). Creating a Delicate Balance: the doctoral supervisor's dilemmas. Teaching in Higher Education, 3(2), 157-172. doi:10.1080/1356215980030203

Egan, J. M. (1989). Graduate School and the Self: A Theoretical View of Some Negative Effects of Professional Socialization. Teaching Sociology, 17(2), 200-207.

Freidson, E. (1986). Professional powers: A Study of the Institutionalization of Formal Knowledge. Chicago: University of Chicago Press.

Gardner, S. K. (2008). 'What's Too Much and What's Too Little?': The Process of Becoming an Independent Researcher in Doctoral Education. The Journal of Higher Education, 79(3), 326-350. doi:10.1353/jhe.0.0007

Gardner, S. K., & Barnes, B. J. (2007). Graduate Student Involvement: Socialization for the Professional Role. Journal of College Student Development, 48(4), 369-387. doi:10.1353/csd.2007.0036

Gardner, S. K., & Mendoza, P. (2010). On Becoming A Scholar: Socialization and Development in Doctoral Education. Sterling: Stylus.

Gennep, A. v. (1960). The rites of passage. London,: Routledge & Paul.

Glaser, B. G., & Strauss, A. L. (2010). Status passage (1st paperback ed.). New Brunswick N.J.: AldineTransaction.

Golde, C. M., & Walker, G. E. (2006). Envisioning the future of doctoral education: preparing stewards of the discipline, Carnegie essays on the doctorate. Chichester; San Francisco, Calif: Jossey-Bass.

Grant, B., & Graham, A. (1999). Naming the Game: reconstructing graduate supervision. Teaching in Higher Education, 4(1), 77-89. doi:10.1080/1356251990040105

Grant, B. M. (2010). Improvising together: The play of dialogue in humanities supervision. Arts and Humanities in Higher Education, 9(3), 271-288. doi:10.1177/1474022210379376

Green, B., & Lee, A. (2009). Supervision as metaphor. Studies in Higher Education, 34(6), 615-630. doi:10.1080/03075070802597168

Halse, C., & Bansel, P. (2012). The learning alliance: ethics in doctoral supervision. Oxford Review of Education, 38(4), 377-392. doi:10.1080/03054985.2012.706219

Halse, C., & Malfroy, J. (2010). Retheorizing doctoral supervision as professional work. Studies in Higher Education, 35(1), 79-92. doi:10.1080/03075070902906798

Hughes, E. C. (1971). The sociological eye: selected papers. Chicago: Aldine-Atherton.

Knorr Cetina, K. (1981). The manufacture of knowledge: an essay on the constructivist and contextual nature of science, 1st Edition. New York: Pergamont Press.

Knorr-Cetina, K. (1999). Epistemic Cultures. How Sciences Makes Knowledge. Cambridge: Harvard University Press.

Larson, M. S. (1977). The rise of professionalism : a sociological analysis. Berkeley: University of California Press.

Latour, B., & Woolgar, S. (1979). Laboratory Life: The Social Construction of Scientific Facts. Beverly Hills: Sage Publications.

Lee, A. (2008). How are doctoral students supervised? Concepts of doctoral research supervision. Studies in Higher Education, 33(3), 267-281. doi:10.1080/03075070802049202

Lee, A., & Boud, D. (2009). Framing Doctoral Education as Practice. In D. Boud & A. Lee (Eds.), Changing Practices of Doctoral Education (pp. 10-26). London/New York: Routledge.

Marshall, T. H. (1939). The Recent History of Professionalism in Relation to Social Structure and Social Policy. The Canadian Journal of Economics and Political Science / Revue canadienne d'Economique et de Science politique, 5(3), 325-340.

Nerad, M. (2010). Globalization and the Internationalization of Graduate Education: A Macro and Micro View. The Canadian Journal of Higher Education, 40(1), 1-12.

Oevermann, U. (1996). Theoretische Skizze einer revidierten Theorie professionalisierten Handelns. In A. Combe & W. Helsper (Eds.), Pädagogische Professionalität. Untersuchungen zum Typus pädagogischen Handelns (pp. 70-182). Frankfurt am Main: Suhrkamp.

Parry, S. (2007). Disciplines and doctorates. Dordrecht: Springer.

Parsons, T. (1939). The Professions and Social Structure. Social Forces, 17(4), 457-467.

Pearson, M., Cowan, A., & Liston, A. (2009). PhD education in science: Producing the scientific mindset in biomedical sciences. In D. Boud & A. Lee (Eds.), Changing Practices of Doctoral Education (pp. 100-112). Abingdon New York: Routledge.

Traweek, S. (1988). Beamtimes and Lifetimes: The World of High Energy Physicists. Cambridge: Harvard University Press.

Van Maanen, J. (1978). People processing: Strategies of organizational socialization. Organizational dynamics, 7(1), 19-36. doi:10.1016/0090-2616(78)90032-3

Weidman, J. C., Twale, D. J., & Stein, E. L. (2001). Socialization of Graduate and Professional Students in Higher Education : A Perilous Passage? San Francisco: Jossey-Bass.

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Exploring the synergies between research programs and postgraduate research degree programs

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Abstract

In this paper, two case studies of internationally successful research development programs and their relationships to postgraduate programs are explored. In one research program, cognitive science principles have been applied to education,