

New directions in doctoral programs: bridging tensions between theory and practice?

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Abstract

The development of new types of doctoral education in the last decades is part of a comprehensive trend in higher education. This trend has increased the number of research students, developed new markets, and consolidated links between research and practice. This paper explores the experiences of candidates and supervisors in doctoral programmes in Sweden, Denmark, and Norway. The study draws on empirical information from interviews, survey data and document analysis. It shows how the new doctorates are heralded as instruments for strengthening the links between researchers and practitioners and between theory and practice. The study also displays how doctoral programmes are plagued by structural, organizational, and conceptual vagueness; tensions embedded in the theory-practice dimension are left to the candidates to be solved. This study discusses how these tensions may affect the professional identity formation of the candidates and its implications for the development of doctoral education.

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The extensive development of new types of doctoral education in a wide range of countries in the last couple of decades is part of a comprehensive and rapidly growing trend in higher education (Jongeling 1999; Boucher, Smyth & Johnstone 2004; McWilliam 2004; Malfroy & Yates 2003; Huisman & Naidoo 2007; Taylor 2008; Blackman 2016; Wildy, Peden & Chan 2015; Khem 2006).¹ The developments have been described as a global shift toward relevant, applied, and field-based doctoral studies (Wildy et al. 2015).

The changes are considered a response to several societal challenges and new requirements for more practice-oriented, relevant doctoral programmes (Scott 2004; Wildy et al. 2015). With the rise of the knowledge economy and competition for students on doctoral programmes, flexibility of learning, and new routes have appeared to obtain a doctorate, national and international programmes have become central to institutions in an economic market that presupposes an engagement with a range of different types and sources of knowledge (Poultney 2010; Servage 2009; Khem 2006). Furthermore, a perceived increase in the demand for research skills in non-academic settings also helps to explain the growth in new doctoral education (Servage 2009). In Europe in particular, the development is seen in the relation to the Bologna process and Lisbon strategy. Doctoral education has become a part of the higher education institution strategy to attract the best students to compete internationally as well as nationally (Bitusikova, 2009, Khem 2006).

New doctoral education creates opportunities for advanced professional training after a master's degree. Some consider these programmes to be a collaborative tool to create stronger connections between researchers and practitioners within and between disciplines. Scott & Morrison (2010) has described this development as a reflection of internal and external pressures on institutions to modify the doctoral experience, initiated by governments who want closer ties between doctoral study and professional practice. Often the change is seen as a response to the complexity of 'real world' problems and the requirements for a multidisciplinary professional approach (Boucher, Smyth & Johnstone 2004).

Research on the cultural and pedagogical challenges that new doctorate programmes bring to the research PhD has shown that 'researching in professional contexts pedagogically

¹ In this article, we use the terms *new doctoral education/programme* and *doctoral education* for the education in question. The often-used anglophone distinctions between a professional doctorate and PhD do not capture the varied types and characteristics of doctoral education in different national contexts. In the Scandinavian approach, all doctoral education is framed and labelled as a PhD, although different programmes emphasise the practice and professional dimension in their own way.

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provides challenges to both the professional and programme designers who have to meet burgeoning agendas demanded by (a) the learning outcomes of the award itself, (b) professionals working as both researchers and professionals in situ, and (c) responding to the changing nature of the professional doctorate which provides alternatives to the purist or traditional nature of research as exemplified by the PhD route' (Poultney 2010:74). Poultney's study raises questions about how modes of knowledge production for professionals are different from the disciplinary PhD, but may be similar in terms of the status of their doctoral level (Gibbons 1999). This tension challenges the development of doctoral programmes and their curriculums. The different modes of knowledge production and how they are distinct from, but nevertheless equivalent to (in their doctoral level status), can be problematic when trying to shape the new doctoral education.

This paper focuses on new doctoral programmes in education. In particular, we investigate the boundary zone made by joining the characteristics of the conventional doctoral education with a professional orientation in new doctoral educations. The concept of a 'boundary zone' will be defined in this article as 'a place where elements from (different) activities are presented [...] to describe the learning that takes place when ideas from different cultures meet and form new meanings' (Tsui & Law 2007, 1290).

Several factors drive the development of doctoral education and affect how practitioners undertake these doctorates for professional development. We focus on how professional institutions encourage programmes to raise the qualifications and prestige of the profession at the same time that universities are starting to emphasise workplace learning and experience-based knowledge (Wildy et al. 2016).

The Nordic setting has a long tradition of a government-funded and regulated higher education sector. The government inducements for education policy work in tandem to place the new doctorate on a larger societal field with many interests at play. As we will show in later sections, Nordic countries have assumed that the boundaries between practical education and traditional academic institutions are open to change.

Studies show tensions on the path to a new doctorate based on cultural and pedagogical challenges. Institutions struggle to provide robust educations while maintaining space for diversity across doctoral routes (Poultney 2010). In the field of education, similar tensions reflect cross-disciplinary interests and the strains between disciplinary pedagogy and

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professional training. How these tensions play out in real life varies. One example is introducing distinctions between praxis-oriented teacher education and disciplinary educational programmes that emphasise basic research (Angervall & Gustafsson 2015). Professional doctoral students illustrate the diversity of the student groups, many of whom are mature, mid-career, and 'time-poor and experience-rich' (Willey et al. 2008). This diversity has implications for the curriculum, pedagogy, and assessment of future professional doctorates (Wellington & Sikes 2006; Poultney 2010). For these reasons, calls have been made for further investigations into the experiences of professional doctoral students in different contexts and settings (Wildy et al. 2016; Wellington & Sikes 2006).

Although researchers have investigated new doctoral educational standards, professional doctorates, and professional PhD programmes from several angles, few studies have focused on the experiences of students and their supervisors in Nordic countries. This study looks closely at the potential hinderances to and motivations for new doctorate programmes. Because there is a general tendency in education to view professional-oriented academic programmes not only as supplements, but also as potential replacements for traditional academic programmes (LaPidus 1997, 2001), an investigation into how knowledge is understood, communicated, and developed within these educational programmes is of relevance to the field.

Research Questions

Linking practice and theory is often considered to be ideal at policy level, but such notions are also often introduced without clarification (OECD 2007; Rasmussen & Holm 2012; Nutley et al. 2003). Practice and theory are inherently vague concepts (Wittek and Kvernbekk 2011, 683). Thus, within newer practices in education, ambiguities are an expected part of the realization process. There can be a great variation in how parties conceptualise theory and practice regarding their epistemological anchors, what practices they want to pursue, and what kind of development and learning one should encourage for PhD candidates.

We explore the following research questions: What opportunities do new doctoral programmes bring to strengthen the link between educational researchers and practitioners and their development of research-based knowledge? What challenges and possibilities exist for candidates in the new doctoral programmes?

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New doctoral education?

The increase in new doctorate programmes has led to different models of education, ranging from the conventional PhD, to professional doctorates, work-based doctorates, practice-based doctorate, the New Route PhD, and PhDs by publication (Poultney 2010; Scott & Morrison 2010, Boud & Lee, 2009)². In the USA, UK, Australia, and New Zealand, the professional doctorate has been established and has spread at high speed (Servage 2009). These doctorates are often defined in contrast to the conventional doctorates through their emphasis on interdisciplinary and applied knowledge, alignment with industry and workplace competences, and their alternatives to the dissertation as a final project (Servage 2009; Boud & Tennant 2006; Green & Powell 2005; Neumann 2005). However, anglophone countries have no universal definition for professional doctoral degrees (Chiteng Kot & Hendel 2011). The characteristics of the professional doctorate developed in anglophone countries differs from new doctorate programmes in other countries and regions. For example, new doctoral programmes in the Scandinavian countries, although similar in terms of being practical and application-oriented, are mostly structured in the same way and have the same requirements and final project as conventional doctorates. In the Scandinavian countries, this can be illustrated by how most doctoral education leads towards the degree of PhD, finalized with a research project and a PhD thesis (Råholm et al. 2010; Ahola et al. 2014). Also, within the provisions itself there is variation between taught doctorates, practice-based doctorates, and other means of assessment. A professional doctoral programme usually combines instruction work with a research project (Taylor 2008). The programmes often have a formal structure with a timetable, clear milestones, and a three- to four-year study plan. These professional programmes provide students with a network and an opportunity to share experiences and get peer group support. Taylor (2008, 68) describes how the content of the professional doctorate is often highly applied and directly relevant to the workplace. Nevertheless, it is recognised that ‘the structure, focus and nomenclature of professional doctorates can vary wildly’ (Wildy et al. 2016, 763).

² See Scott and Morrison 2010, Poltney 2010 and Boud & Lee (2000) for a more elaborate discussion on the diversity in doctoral education and the different types of doctorate programs.

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Theoretical and Analytical Framework

Our analysis applies analytical concepts from two theoretical traditions. The first aims to grasp the challenges created by the introduction of new doctorate programmes in academia. Taylor (2008) argues that the professional doctorate resembles the Mode 2 of knowledge production described by Gibbons et al. (1994) because of its applied nature and its relevance to the workplace. Gibbons distinguishes between two sets of cognitive and social knowledge practices, Mode 1 and Mode 2 (Gibbons et al. 1994; Gibbons 1999). Most university models of knowledge production fall within the Mode 1 disciplinary structure. Mode 1 represents the production of knowledge characterised by the hegemony of theoretical or experimental science, by an internally-driven taxonomy of disciplines, and by the autonomy of scientists and universities (Nowotny et al. 2003). This model is contrasted with Mode 2, which describes five attributes of knowledge production (Gibbons et al. 1999): 1) knowledge is produced in the context of practice; 2) transdisciplinarity is necessary to guide problem-solving that is both empirical and theoretical; 3) organizational diversity is needed for varied skills and experience; 4) enhanced social accountability and reflexivity permeates the knowledge production process, reflected not only in the results but also in the problem and the research priorities; and 5) a broader system of quality control manages additional criteria added through practice, which incorporates a diverse range of intellectual, social, economic, or political interests (Gibbons 1999, 33). Gibbons' attributes are used to identify and discuss the knowledge development process. These applications illustrate potential barriers and motivations reported by PhD students and their supervisors.

The second component of the analytical framework relates to the doctoral programmes' aim to develop not only practice-oriented knowledge but also highly qualified practice-oriented professionals. We explore the concept of *trajectories of doctoral identity formation* to discuss how learning and development at a personal level are linked to learning and development at an organisational level. This concept originated from the idea of learning trajectories, suggested in Dreier (1999; 2008) and further developed in Wittek (2013; 2016; Wittek et al. 2015). This concept allows for the flexible and dynamic conceptualisation of what professional identity formation is about. It focuses on the individual level of professional learning, but argues that individual and collective processes of learning are closely intertwined (Wittek et al. 2015).

It is assumed here that the candidates' trajectories follow the shape of more stable institutional or disciplinary cultures. The candidates in our empirical studies are typically

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located on the border between traditional Mode 1 academic institutions and institutions that are closer to Mode 2 knowledge production. Such border locations will be considered 'boundary zones', already defined as the place where elements from different activities are presented' (Tsui & Law 2007, 1290). We look at doctoral identity formation that takes place when ideas from different kinds of knowledge production come together. The concept of a boundary zone is also related to the value of diversity and the benefit of approaching differences by creating a shared space for learning and development. In this sense, a boundary zone has the potential to create common ground so that knowledge can be shared across organisational or community lines (Scaratti, Ivaldi, & Frassy 2017).

The distinction between Modes 1 and 2 has been used to characterise the contexts of students during the doctoral programme. The notion of a boundary zone in the context of the programmes relates to how these contexts allow for different modes of knowledge. It shows the extent to which participants can create knowledge based on transdisciplinarity and organisational diversity through a broader system of quality control including intellectual, social, economic, or political interests. Boundary zones can create opportunities for participants to engage in discourse-crossing boundaries to identify and potentially resolve contradictions related to teaching practices in their academic and professional communities (Tsui & Law 2007); however, whether they do fill such a function is an empirical question.

Within the identified areas of tension, we discuss the motivations and barriers that we found through our analysis of students' and supervisors' experiences with new doctoral programmes in the boundary zones between Mode 1 and Mode 2. Based on our analysis we discuss how the trajectories of doctoral identity formation are constituted within these zones.

Methods

We draw on three different studies of new doctoral programmes, one from each of three Scandinavian countries: Sweden, Denmark and Norway. All three countries have developed new doctoral programmes in the field of education during the last decade. We apply an explorative approach, re-analysing published documents, reports, and articles on the doctoral programmes.

Table 1. Overview of the three studies on doctoral education in Scandinavia

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Three Scandinavian Doctoral Educations

Administered by the Swedish National Agency for Education (Skolverket), the Swedish doctoral programme was a government-initiated and -funded project. It was a combined effort to bring theory and practice closer together by recruiting experienced teachers to doctoral programmes. The programme emphasised practice-oriented PhD projects. Funding came in three parts: from the PhD programme at the university, from the initiating government body, and from the district school authority that employed the teachers. The programme was part of a larger research programme run by the Swedish government in the early 2000s. The government abruptly ended the programme and stopped its funding in the mid-2000s because of national fiscal issues. Most doctoral candidates that were part of the programme continued their PhD studies (Thelin 2009).

The Danish doctoral programme was administered and funded by the Danish PhD Council. Their chosen approach was to recruit doctoral students from professional teacher education programmes in professional colleges in consortiums with PhD degree-granting universities. Danish doctoral students were supposed to work at both institutions during the scholarship period (The Danish PhD Council, retrieved 10.03.17, <http://www.au.dk/en/phd/uddforsk/phd-in-educational-research/>). In both studies, doctoral projects needed to be practice-oriented and connected to the teachers' education and work. The initiative was started in 2011 and is still running.

Initiated and funded by the Norwegian Research Council, a network of Norwegian higher education institutions formed a national graduate school in 2012. This initiative aimed to address the demand for higher competency and a stronger research base in teacher education. The initial establishment of the graduate school was linked to a national research programme to enhance practice-based educational research. The founders considered the interplay between the educational system and knowledge development in society and work (The Norwegian National Research School in Teacher Education NAFOL, graduate school initiative, retrieved 10.03.17, <http://nafol.net/english/>). As such, the participants work as teachers in higher education institutions offering teacher education.

Data Sources

The data is a combination of interview data and document analysis reported in six publications: one pilot study on the Swedish programme (Prøitz 2005), two research-based evaluation reports of the Swedish and Danish programmes (Thelin 2009; Kyvik, Prøitz &

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Aamodt 2015), one evaluation report and one self-evaluation report from the Norwegian programme (Norwegian Research Council 2013; Smith et al. 2015), and an article discussing the qualities of the Norwegian PhD projects (Østern 2016). The reports draw on substantial data, citing interviews with 20 doctoral candidates and 21 teachers and supervisors of the Swedish and Danish PhD programmes. Electronic surveys were sent to 69 Norwegian doctoral students. An overview of the studies can be seen in Table 1.

The material for this paper has been collected and analysed for various purposes. The studies somewhat diverge in, structure, length, and content, which necessitates a certain level of caution in analysing, interpreting, and making conclusions. On the other hand, the fact that the studies overlap in terms of their research questions, their investigative focus, and in how the methods applied resemble each other provide a common ground for the re-analysis conducted in this study. Furthermore, we consider the material appropriate to discuss the ability of a given doctoral education to link theory, research, and practice. See also Table 1 for more details on the empirical studies used in the re-analysis.

Table 1 Overview of **the empirical studies used in the re-analysis**

New Doctorates in Education

New doctoral programmes in education in the Scandinavian countries collectively aim to strengthen the quality and relevance of educational research and to teach a new generation about practice-oriented educational research. The programme design varies by study, but all are organised around the idea of developing a new type of doctoral candidate educated at the meeting point of theory and practice. Various approaches have been used to reach this meeting place. The new doctorates are separated from the conventional doctorates in the studied countries through the emphasis on: the principle of closeness to practice, partner relations, and career prospects.

The principle of closeness to practice is seen in all three studies through the ambition to bring theory and practice together by recruiting strong PhD candidates. These candidates either already have teaching experience, were students in teacher education, or worked in teacher education at professional teacher education institutions. *Partner relations* means bringing in various actors within the doctoral education, such as school district administrators and professional colleges that are expected to commit to the idea of focusing on practice. A central aspect of these relationships is *career prospects*. The doctoral candidates are expected

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to have a connection to their previous workplaces, and some continue to work during the PhD programme. To a varying degree, there is also an explicit expectation that PhD candidates will return to teach after the degree to contribute with their new, advanced skills.

The following analysis considers the identified aspects of the PhD programmes in our study's example countries.

The principle of closeness

The Danish PhD students are employed by two institutions, the doctorate-granting university and a professionally-oriented college. This requirement ensures that the PhD student has a strong relation to the field of practice. The PhD candidates were asked about their experiences with having two workplaces. Their answers varied, with almost half of the respondents satisfied with the arrangement and 23 percent finding it troublesome. Some students pointed out various issues as problematic in the commentary space of the survey:

Student A: To be working in two workplaces that are so different is a great challenge. It requires a substantial amount of time to understand the administrative procedures at two different institutions.

Student B: It is almost impossible to become fully integrated and to fully engage in the two working places. (from Kyvik et al. (2015,29), all quotations have been translated from Scandinavian to English by the authors.)

Danish supervisors were asked in the survey about their experiences with this arrangement. Most respondents agreed with the concept and considered the arrangement important, but they also pointed out challenges in having two workplaces.

Supervisor A: This gives some problems for the student, but also some benefits, because the two institutions emphasise different things: academic research and practice-oriented research, which is an ideal combination for the university colleges. (Kyvik et al. 2015, 29)

One supervisor stated in interview that 'this is a recipe for stress', while others pointed out the problematic aspects of PhD students working at the teacher education college and not spending enough time at the university. This is a problem because the students have

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challenges getting into 'academic culture' and the culture of research. One of the supervisors says in interview that:

Supervisor B: The candidate that comes from the university colleges knows that environment from the inside. The problem is that they get stuck in the university college way of thinking and that they do not get into the research society at the university. (Kyvik et al. 2015, 30)

This arrangement is seen as both a problem and the status quo for students coming from university colleges. Some feel it shows a lack of respect for the time that PhD students need to research (Kyvik et al. 2015, 30).

In Sweden, the PhD students were teachers who could, under certain circumstances, apply for a PhD scholarship financed by a three-part agreement between the government body Skolverket, the district, and the PhD-granting university. The initiative supposed that PhD candidates would return to their schools and municipalities with new, practice-oriented competencies. PhD candidates were asked about their experiences with academia, and informants noted that it was not easy to enter academic society. Many felt they were in an unknown world without support or help, with new codes and hierarchies to learn (Thelin 2009, 76):

Student X: To enter into the research community is to familiarise yourself with a whole new world, where you are suddenly the one lowest in all hierarchies. I thought it was hard the first two years, but now I feel more at home in research. Maybe there is a need for some kind of introductory course for PhD students with long working life experience. (Thelin 2009, 76)

PhD candidates that refer to more positive experiences belong to a certain graduate school. In retrospect, they consider it to have been fantastic, although they also felt a certain degree of being lost at the beginning: 'It hasn't been easy. I did not feel welcome at the university, but on the other hand, the graduate school has been fantastic!' (Student Y, Thelin 2009, 76). Another informant pointed out that being a PhD candidate is a completely different job than being a teacher and that it required a mental transformation: 'Research is another job. It collided for me' (Student Z, Thelin 2009, 76).

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The Swedish PhD candidates describe being shocked by their experiences with academia and overwhelmed with feelings of loneliness, low self-esteem, and little support. They also express gratitude for the opportunity and feelings of privilege to be able to focus deeply on the issues that interest them. The informants also highlight the importance of graduate schools and seminars that provide structure and support to their work.

The pilot study of the Swedish study illustrates how the Swedish candidates struggled with several conflicting issues related to their education (Prøitz 2005). One issue was how they were received in academia, another was the reaction in academia towards their research being practice-oriented and anchored in their experiences as teachers or school leaders. They felt academics did not understand the value of practice. They also expressed concerns about becoming too academic to maintain their practice-oriented perspectives. These opinions contrast with the views of programme leaders, who claimed that the candidates' concerns were part of the necessary development for PhD students. The informants viewed moving from a practical to an academic focus as a natural part of the development of a research identity (Prøitz 2005; Aasen & Prøitz 2009).

The Norwegian research school, NAFOL, was initiated by the Norwegian Research Council to enhance practice-related research in education (Norwegian Research Council 2013). PhD candidates were invited from participating institutions. NAFOL was evaluated positively in the self-evaluation report by the candidates and supervisors.

Østern's study (2015, 16) of 140 PhD projects found that the overarching discourse for the candidate projects was a 'solidarity discourse.' All the projects had a common aim of contributing in substantive ways to Norwegian teacher education research. This demonstrates the candidates' high levels of commitment to the profession.

Candidates in NAFOL are specifically encouraged to use empirical material from educational practices in their research (Østern 2015; Smith 2015). This is underscored in the leading principles for the school. However, the concept of practice is complex. The research conducted by NAFOL candidates is primarily explanatory and descriptive, and infrequently driven by theory or hypothesis (Smith 2015). The dean of a partner institution said:

NAFOL creates ownership in the profession of teaching, and researches on it. By strengthening the research competency, it will in the long term develop better research that will lead to better education and practice. (Smith 2015, 2)

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The evaluation report (Smith 2015, 6) states that further development should encourage candidates to be more critical and ground-breaking in their projects. An important objective of NAFOL is to strengthen student identities as teacher educators, ‘as the goal is that they will keep on working as teacher educators after [the] completed PhD’ (Smith 2015, 7).

Partnership relations

The three doctoral programmes involve several types of partnerships. As expressed in the policy documents, partnerships are considered an important part of developing practice-oriented education research and providing professionals with this resource.

These studies show that the organization of doctoral education is complex, but that it enables the recruitment of students who are genuinely interested in practice-related questions and who will develop doctoral projects related to practice (Kyvik et al. 2015; Østern 2016; Thelin 2009; Prøitz 2005). However, there are challenges to keeping partners active and committed.

In the Danish study, schools are required to form consortiums with at least one professional school and one university. Doctoral projects are to be developed with collaboration across the consortium, with the university responsible for the application process and doctoral education. Most supervisors who were interviewed expressed satisfaction with the consortium, as it had been productive in linking applied research and developmental work to the doctoral projects. Problems were noted when doctoral applicants were granted scholarships from institutions outside the consortiums or applicants could not apply because they belonged to research groups outside the consortium. Most people who were interviewed believed the cultural and disciplinary differences between institutions prevented these partnerships from increasing collaboration.

The Swedish candidates had a municipal partner. Most reported having some organised contact. Some candidates had regular meetings with a contact person, though most had only occasional meetings, and some reported that they had not heard from the district since the contract was signed. Several candidates mention frequent personnel changes in the district, and that it was hard to know ‘who’s who’.

In most projects there was some kind of personal relationship between the municipal and the supervisor or candidate. One supervisor expressed surprise over the enthusiasm to fund a doctorate, considering the municipal’s strained financial situation and the

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responsibility of such a commitment. One supervisor describes a disagreement over recruitment:

When recruiting doctorates, we want the best, but when the local authorities also shall have an opinion on this, it is not unlikely that they will pick a person on third or fourth place on the list. Our experience is that this causes problems (Prøitz, 2005).

In Norway, the candidates are enrolled in doctoral programmes at one of 23 partner institutions, with NAFOL as an added value. They aim to enable many teacher educators to achieve PhDs. The decision to qualify teacher educators through higher research skills is interesting (Østern 2015, 2), because teacher education internationally often takes the opposite direction and seeks to educate teachers primarily through practice.

Career ambitions and opportunities after the doctoral education

In the Danish study, candidates are expected to work in teacher education after earning their degrees. However, it is uncertain whether the candidates will be interested in working in institutions without research funding. Danish candidates were asked questions about what kind of career they wanted after their degree: 9 percent wanted a position at a university, 31 percent wanted to go to a university college (offer primarily Professional Bachelor's programmes) and 34 percent considered both types of institutions. The last 26 percent had not decided at the time of the survey (Kyvik et al. 2015, 42). Doctoral candidates were also asked questions about their thoughts on future opportunities. A majority of 63 percent considered these opportunities good, and 23 percent considered them satisfying. No one considered the opportunities to be bad. They were also asked about using their research competence in teacher education: over 60 percent answered that the opportunities were good, and only 3 percent answered that they were bad (Kyvik et al. 2015, 42). These survey results illustrate that doctoral candidates in Denmark have high hopes for the future and look forward to the opportunity of doing research within teacher education.

The Swedish doctoral initiative expected that partnerships with district school administrations would lead to continued employment after the degree, but the doctoral candidates viewed the partnership in a different light. Those students who were interviewed wished for a situation in which they could have one foot in academia and one in practice. Few candidates expressed concern over leaving everyday school life. Some expressed

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concerns about their future possibilities with the local authorities. One person pointed out that the relevant positions did not exist yet, but she expected that suitable positions would come.

If I have to teach, then it must be in the university college or university. I do not want to go back to school! More than anything I would like to have a position as an investigator.

I would really like to go back to school if there were positions available. I would like to do research on my own practice and develop school. (Thelin 2009, 121)

When asked their thoughts about the candidates' future, supervisors split into two camps. One group claimed the reason for participating in research education was to become a researcher. The other was more open to alternatives; one supervisor saw the candidates' futures belonging to their local communities. He thought the district would have to find new structures in their school systems to get something from the money they invested in the teacher's new skills (Thelin 2009; Prøitz 2005; Aasen & Prøitz 2009).

A critical evaluation of the Norwegian teacher education, published in 2006 by the Norwegian Institute for Quality Assurance (NOKUT), brought about the decision to strengthen research-based teacher education (Østern 2015, 5). There had been persistent concern regarding the slow production of PhDs (Thune et al. 2012). A political decision was made in Norway to make a master's degree the basic level qualification for all teachers in 2017. This inspired the founding of a national research school for teacher education (Østern 2015, 5). With the need for many master's degree projects in teacher education, more recipients of PhDs are needed supervise these theses. NAFOL aims to keep the candidates working in institutions offering teacher education after the completed doctorate. Deans and board members in partner institutions consider NAFOL to have a distinct role in transforming Norwegian teacher education to a master-level programme.

When teacher training becomes 5-year programmes in 2017, the interest for developing research and being part of a scholarly community will be there. (Dean)

The need for NAFOL is still high, and I hope NAFOL will be a service even after 2021. We need it because we shall implement 5-year teacher education over the whole country. (Board member)

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Discussion

New doctoral programmes are uniquely placed where theory and practice converge. In this article we have conceptualised these meeting points as boundary zones, and the candidates that are supposed to work in these boundary zones are typically experienced teachers, but novices when it comes to research. Along with the participants, there are a whole range of idealistic and broadly formulated intentions for building bridges between theory and practice. However, explicit clarification of what the terms 'theory' and 'practice' refer to is rarely clarified. The requirements for a conventional research PhD are rich and clearly described in policy and strategy documents, but the characteristics of a practice-oriented PhD are not described in the same detailed way. We did not find specifications on what separates a practice-oriented doctorate from a conventional research PhD. This ambiguity creates challenges and interesting possibilities. This study displays how doctoral students experience two standards, one represented by traditional structures of the university through the formalities of the doctoral programme, and another represented by an emphasis on practice. These conflicting standards manifest in a divergence between conventional PhD programmes and the new doctoral programmes, as discussed by Angervall and Gustafsson (2015). The boundary zones that are offered to the PhD candidates are filled with conflicting standards and tensions, and they seldom offer supervision regarding how to navigate in these zones.

Table 2 illuminates the tensions candidates felt. There are some interesting tendencies across the studies. First, candidates expressed obligation to support the field of practice in their projects. They felt that the requirements of the doctoral programme made them write as 'real researchers', an idea closer to Mode 1 knowledge production than Mode 2. The knowledge production defined as Mode 1 in Gibbons' distinction represents traditional research ideals. Lacking clear and understandable criteria for the practice-oriented approach, it is probably easier to grasp the traditional criteria, which are more established. The blurry conceptualisations of practice-oriented research that the candidates are offered create tension for the student. Our analysis indicates that they get hardly any supervision regarding how to cope with conflicting or unclear values and ideas of knowledge production modes.

Even though transdisciplinary approaches to problem solving are highly valued within Mode 2, candidates move towards disciplinary approaches as they proceed in their doctoral work. Our analysis indicates that the trajectories of their doctoral identity formation changes over the course of their project. The candidates are typically recruited from the field of

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practice and have worked as teachers or teacher educators. At the start of their doctorates, they express high levels of commitment to the profession. However, they gradually turn towards the characteristics given by Gibbons in Mode 1 knowledge production when they describe themselves and their doctoral identity. This must be seen in light of how criteria for traditionally academic theses are richly developed, but there are no or very few criteria for practice-oriented research. In all three studies we find frustration among the candidates regarding their belonging to two types of institutions. They describe it as challenging and state that the two practices are very different, emphasising different ‘things’. However, they do not really understand what these differences are about. They do understand that there are differences in modes of knowledge production, but not what it means conceptually or what it requires from them.

Table 2 Summary of the results and tensions according to Gibbons’ five attributes (Gibbons et al. 1999)

Candidates struggle in the boundary zones between traditional academic cultures and practice-oriented cultures. They are expected to produce research at a high level while simultaneously teaching and working on professional development. They are supposed to be *boundary crossers*, actors that mediate between the different practices involved, creating something new that is importance to both sides (Akkermann & Bakker 2011). The candidates find this role to be difficult. Some experience the feeling of loneliness and say that it is almost impossible to become fully integrated in both practices. Others highlight the lack of status connected with coming from the practice-oriented tradition of the university colleges, and even state that they do not feel welcome at the research universities. Such experiences are linked to low self-esteem or frustration, based upon a large number of those interviewed in our study. Boundaries can create ‘a sandwich effect’ (Akkermann & Bakker 2011, 21), in which people confront multiple meanings and perspectives stemming from sociocultural diversity. At the same time, candidates move beyond the boundary, since they are not constrained by this multivoicedness. As academic novices, they are in a middle ground. The multivoicedness and lack of specificity in boundaries prompt a negotiation of meaning, and might also explain why boundaries remain unidentified as challenging. Some candidates characterised academia as an unknown world without much support or help and with several new codes to learn. As illustrated earlier, one of the Swedish candidates stated, ‘To enter into

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the research community is to familiarize yourself with a whole new world, where you are suddenly the one lowest in all hierarchies.' It is important to note the difficulties that the candidates have in understanding what the different modes of knowledge production are about and what it means for the work they are doing in their own research.

Our analysis finds clear indicators that the organizational structures around the doctorate are challenging. They create the potential for learning and development through relating and contrasting experiences with others. Candidates found graduate schools helpful and supportive, both for their own research and because the goals for their doctoral work are explained to them by experienced researchers. The graduate schools themselves can also be identified as boundary zones, which are distinct from the boundary zones that the candidates experience as individuals. Graduate schools are considered as a boundary zone at an organisational level; the support of being part of a larger community is underscored by the candidates, who also appreciated having experienced researchers as mentors. However, other supportive structures in the boundary zones seem to fail. Danish candidates state that it is almost impossible to become fully integrated in two working places and that they lack the structures that can help them understand, conceptualise, reflect, and take a stance on the differences between the two modes of knowledge. Candidates use terms like 'hanging in loose air' when they describe academia. They describe their time in this boundary zone as 'a lonely situation' or 'a completely different job'. Their place as boundary crossers certainly presents societal challenges and new requirements for practice-oriented PhD programmes.

In all three contexts, practice is important for the candidates' research. Whether this model should supplement or replace a traditional doctorate is rarely discussed concretely. In Norway, there has been a request for a clear qualification system for practice-based and professional research (Vøllestad et al. 2012). Questions of specific criteria have not yet been addressed, but space is left open for a range of questions and frustrations (Engelsen et al. 2013).

Gibbons et al. state, 'In many areas of scientific advances, knowledge production is cutting loose from the disciplinary structure and generating knowledge which, so far, is not being institutionalised in the conventional way' (1999, 23). Gibbons explains that the disciplinary structure sets the terms of what counts as knowledge. Like Plowright and Barr (2012), we find that doctorates in teacher education need a new professionalism driven by wise, practical judgment-based reasoning, which aligns with the context and reflective nature of teaching. New doctoral programmes clearly emphasise the core ideas for Mode 2

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knowledge production, which is how doctoral projects are expected to be grounded in practice-related questions, but how this ambition is to be realized in the new doctoral programmes is seldom explicated. However, graduate schools seem to help the candidates to gain some of the learning potentials that exist in boundary zones. According to Akkermann and Bakker (2011), one of the important learning potentials within boundary zones is about identification. It is about being able to identify characteristics of the different practices, see their similarities and differences, and then position oneself on the basis of those differences. However, these are complex processes, far too complex for novices to conduct alone.

As academic novices, candidates' experiences and conceptualizations of the doctorate are largely formed by the programmes' structure. Candidates enrolled in Scandinavian PhD programmes and research schools are offered tools for their professional identity formation, including seminars, courses, and assessments by international experts. These are important in students' trajectories of identity formation, as they bring different signs, symbols, and experiences into new meaning (Wells 1999). Doctoral identity formation follows the lines of the representational systems that the candidates are introduced to, namely the professional cultures existing around them. Mode 2 knowledge production is underscored as the ideal for practice-oriented research at an intentional level for new doctoral programmes in all Scandinavian countries. However, in our analysis we found few examples of what practice-oriented research should look like. Rather, both candidates and supervisors strive to identify the differences in concrete and practical terms. It is highly relevant for educational research to use structural aspects such as the principle of closeness to practice, but how can this be organised? A promising place for such complex boundary work is the graduate school, where the 'new' doctorates are part of a community where challenges can be explored in collaboration with and under the supervision of experienced researchers. However, candidates are often left to solve the tensions that follow from the unclear objectives of the new doctoral programmes by themselves. Studies show that academic and educational discourses indicate divergent conceptions of the programmes' purposes, structure, and quality criteria. Our study shows that the five attributes of Mode 2 appear as high-tension areas. We believe that a public discourse around these areas is of high importance. We cannot leave it up to the novice candidates to deal with their role as boundary crossers between practice and theory. The complexity and ambiguity that exists within these boundaries needs to be approached by strong communities with a high level of competence and willingness to create fruitful methods of gaining knowledge. Important questions to address are, first, the learning

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outcomes of the doctorate itself, second, the modes of knowledge production at the boundary between traditional research and professional research, and third, the descriptions and criteria for the different routes to a doctoral degree. This discussion needs to be addressed by an international community of scholars, and cannot be left up to doctoral candidates as individual actors.

Conclusion

Our first research question asked what opportunities the new doctoral programmes in education provide to strengthen the link between educational researchers and practitioners and their development of research-based knowledge. The approach used to meet the request for linking doctoral education together with professional practice in the Scandinavian countries has been to establish new doctoral programmes as alternatives to the conventional research doctorates. Practitioners have been recruited to these positions, but even though they start out with a strong commitment and loyalty towards the field of practice, they gradually identify themselves more with the Mode 1 of knowledge production, identified by Gibbons et al. (1999). Based on our analysis we interpret our observations as a consequence of the lack of explicit objectives and plans for what it means to link theory and practice, how this can be conducted in the research the candidates enact, and how this new doctoral thesis is supposed to be assessed differently from those of traditional doctorates. Candidates work in boundary zones between research institutions and schools or university colleges, and they experience the role as boundary crossers as challenging in many ways. They find it difficult to understand what is expected from them in the boundary between practice and theory, and they report that they do not receive enough help in these struggles. However, the graduate schools have the potential to strengthen the link between educational researchers and practitioners and their development of research-based knowledge. These graduate schools form boundary zones, in which the candidates work within a community, and in which they can explore the difficult questions between modes of knowledge production with colleagues and mentors that have more experience within practice-oriented research.

The second research question we asked was what challenges, difficulties, and possibilities exist for PhD candidates in the new doctoral programmes. More research is needed to answer this question in more depth, but the tensions and tendencies uncovered by our study are of importance for a public discourse about modes of knowledge production, what kind of research agenda might benefit our future society, and what types of quality

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control we need to develop. We believe that it is of great importance that we address these complex questions as an international community of scholars. The boundary zones between the practices of conventional and new doctoral programmes are of high complexity involving both intellectual, social, economic, and political interests.

These interests deserve to be linked, organised, and supported at a structural level, not on the level of individual doctoral work conducted by novices in research. The tensions identified in this article clearly illustrate that the kind of vagueness we deal with when we talk about 'theory' and 'practice' often results in dilemmas that have to be handled by the individual doctorates candidates. Roy Sorensen (2006) argues that most words are both vague and ambiguous simply by virtue of having multiple meanings. As we have seen, the concept of practice indeed has multiple meanings. Stakeholders such as supervisors, programme managers and those responsible at the national level for doctoral education should address these challenges and contribute tools that can facilitate doctoral candidates' routes through the boundary zones between 'theory' and 'practice'. Trajectories of professional development unfold at individual and collective levels in the doctoral programmes, but these levels are closely woven together. There is a need to focus on questions about modes of knowledge production and to explore what constitutes the practices that unfold within this frame. Candidates can probably benefit greatly from being invited into such discussions. Gibbons et al. (1994)'s distinction between Mode 1 and Mode 2 knowledge production might be a beneficial point of departure for such a discussion. But it is of great importance that these discussions are framed by the support of experienced researchers and within robust communities of scholars. Graduate schools seem to have the potential to become important in this regard.

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