

Programme coherence and epistemological beliefs

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Abstract

The aim of this study was to investigate epistemological beliefs and programme coherence in nursing, social work and general teacher-training programmes. An abstract theoretical knowledge base is a key characteristic of professions. However, reports have shown a gap between professional education and professional practice. Data used in this study are taken from surveys among students, college teachers and placement supervisors. The results of this study do not corroborate with the notion of clashing epistemological beliefs between the educational field and the field of practice. However, the results do indicate that the way theories are taught and how students study may influence student views of the importance of theoretical knowledge for professional practice. The general teacher-training programme, more than the other programmes, faces challenges in linking theory to practice. The nursing programme also encounters difficulties in college teachers being able to relate some of the nursing-specific theories to practice in the classroom setting. Moreover, the findings imply that not only programme coherence, but also students' study efforts might be essential aspects in explaining why some students do not perceive theoretical knowledge as important for professional practice.

Keywords:

Coherence

Epistemological beliefs

Professional knowledge

Profession

Introduction

When Dewey (1904) addressed the relationship between theory and practice in teacher education more than 100 years ago, he postulated that the problem would be solved in a few years. Dewey's prediction has certainly not been the case. Instead, creating this relationship has become a key challenge in all professional education programmes.

University programmes are increasingly expected to provide "higher vocational education" (Billett, 2009). Therefore, the difficult theory-practice relationship is a challenge in all facets of higher education. Nevertheless, the challenge is greater in programmes qualifying students for particular vocations or professions.

Previous research among students in general teacher-training (Christensen, Eritsland, & Havnes, 2014) and nursing (Heggen, 1995; Benner, 2010) programmes indicate that students experience classroom instruction and field placement as two very different learning arenas, where different forms of competence seem important for each one. Thus, students may have trouble grasping the relevance of theoretical knowledge learned in the classroom to their field placement and subsequent professional practice. Previous studies have focused on deficiencies in initial professional education as the origin of the experienced gap and perceived lack of relevance of theoretical knowledge to professional practice. In the literature, two main causes of this educational shortcoming are distinguished. First, researcher's have suggested that professional education and professional practice are out of step with each other (Fauske, Kollestad, Nilsen, Nygren, & Skårderud, 2005), and there is an epistemological clash between college teachers and placement supervisors (Joram, 2007).

Second, there is a reported lack of coherence between classroom instruction and placement (Grossman, Hammerness, McDonald, & Ronfeldt, 2008; Smeby & Heggen, 2014). Although these two perspectives are interrelated, the first one focuses on an epistemological disagreement regarding the importance of theoretical knowledge for professional practice among different learning arenas, and the second focuses on the extent to which programme coherence between theoretical knowledge and student placement experiences are emphasised in professional programmes.

The aim of this paper is to examine whether student experiences of a gap between theory and practice are primarily due to an epistemological clash or a lack of programme coherence. First, we examine the possible epistemological disagreements about the importance of theoretical knowledge for professional practice between college teachers and placement supervisors in nursing, social work and general teacher-training programmes. Second, we investigate whether there are differences in how programme coherence is emphasised among the programmes. Finally, we explore the extent to which perceived programme coherence is related to students' perceptions of the importance of theoretical knowledge for professional practice in nursing, social work and general teacher-training programmes. Before we turn to the empirical analyses, our theoretical and analytical perspectives, data and methodology are presented.

The role of theoretical knowledge in professions

The development of an abstract theoretical knowledge base is a key characteristic of all professions (Abbott, 1988). Theoretical knowledge can be seen as a necessary component in professional development (Orlinsky & Rønnestad, 2005; Evans & Donnelly, 2006) and as essential for developing a professional identity (O'Connor, 2007; Heggen & Smeby, 2012). Young (2008) emphasises that scientific theoretical knowledge provides a reliable basis for moving beyond particular cases and has an explanatory capacity for generalisation.

Moreover, theoretical knowledge can contribute to professional practice by ensuring more reliable diagnostics, providing a foundation for better understanding of human behaviour and promoting self-reflection and critical reflection over existing practice (Smeby, 2013; Grimen, 2008). Educational training institutionalised in higher education is essential in the development of reflective skills and a critical attitude towards both current knowledge and practice (Freidson, 2001). Medicine is an ideal example because of the success seen in practitioners applying research-based knowledge to solve health problems. Research and evidence-based knowledge are also increasingly emphasised in professional fields that do not have the same academic tradition.

Students in professional programmes must develop theoretical knowledge in a particular field, as well as learn how to perform practical professional tasks. Ryle (1949) emphasises that “knowing that” (i.e., knowing that something is the case) and “knowing how” (i.e., knowing how to do something) are two distinct types of knowledge, and “knowing how” is not a matter of simply applying “knowing that”. Moreover, it is argued that educational institutions tend to prioritise theoretical knowledge over practical skills and ethical-social values, which are essential in professional practice (Sullivan, 2005). In the following sections, we will present two perspectives and the respective theoretical underpinning about what may be causing the gap between classroom instruction and placement: clashing epistemologies and lack of coherence.

Clashing epistemologies

From a social-situated perspective (Lave & Wenger, 1991; Wenger, 1998), the analytical unit is in social systems and the actors’ participation in social practice. Learning takes place as a process of socialisation that involves the steady increase of learner participation in social practice. The focus is not on individual cognitive abilities and processes but on relations, interactions and communication between actors. The crucial point

is that learning and professional development cannot be understood without referencing the context in which they exist. Students in classrooms and students in placements are, in other words, participators in different communities of practice. Even mathematical activities are organised and structured differently in the classroom than in everyday life. These differences are the reason why math pupils often are unable to transfer mathematical knowledge to real-life situations (Lave, 1988).

The focus of each context differs from the other. Whereas the primary objective in classroom practice tends to be training students to pass an exam, the primary objective in professional practice is to help patients or pupils in various ways. Although the purpose of professional educational programmes is to train students for occupational practice, the two learning contexts make up different communities of practice characterised by different logics.

The integration of professional training in universities and higher education institutions has been a conflicting process. Many professional associations have fought against the emphasis of university training and advocated for more practice-based and practitioner-controlled training. In England, for instance, an apprentice-based model in law existed until the latter half of the 20th century (Burrage, 1993). These conflicts are particularly evident in shorter professional programmes, such as nursing, social work and general teacher training (Smeby, 2015). These programmes have been recently upgraded to higher education programmes, and state authorities have declared, “teaching in professional programmes should have a basis in research as well as in practical knowledge” (Heggen, Karseth, & Kyvik, 2010).

From a situated perspective, university and college teachers and practitioners responsible for students during placement occupy separate spheres characterised by different modes of logic and epistemological beliefs. This perspective corresponds with Joram's (2007)

findings that whereas “professors may consider research-based findings and general principles of teaching to be important for their students to learn, many pre-service teachers discount the validity of such materials” (p. 133).

Programme coherence

The content of professional education programmes is justified by its relevance to professional practice (Smeby, 2008), and theoretical knowledge initially becomes meaningful in professional practice (Grimen, 2008; Sullivan, 2005). Studies based on a situated perspective have tended to concentrate mainly on learning within bounded and singular domains, within particular groups of people or within certain domains of practice, such as education and workplace. Although these studies have provided valuable in-depth knowledge about important learning factors in particular practices, they have not given adequate insight into how students develop when crossing different communities of practice. One reason for this inadequacy likely is related to theory; the concept of context inhibits these studies from articulating and explaining how knowledge and learning are generated within and among different learning activities (Hughes, Jewson, & Unwin, 2007).

The activity theory and its concept of expansive learning (Engeström, 2001) have been used to accentuate transfer and the role of collective activities in processes of learning (Tuomi-Gröhn & Engeström, 2003). Teachers, students and employees act as boundary crossers between school and work, engaging in the interpretation and development of knowledge to try to change organisational practices. Different learning arenas generate different perspectives about knowledge, and knowledge acquired by students in college must be recontextualised through negotiating processes to become useful in practical work. Boundary crossing and recontextualisation are challenging, but they involve important learning opportunities (Engeström & Sannino, 2010; Smeby & Vågan, 2008; van Oers,

1998). From this perspective, the challenge in professional education is to facilitate students' boundary crossing and develop their abilities to recontextualise knowledge between the contexts of education and professional practice.

Recontextualising knowledge may also be considered as the ability to create meaningful relationships between different types and aspects of knowledge. In recent years, the challenges of creating meaningful relationships between theory and practice and clarifying the relevance of theoretical knowledge have received increasing attention by researchers, particularly in relation to students' learning outcomes (Grossman et al., 2008; Sullivan, 2005). This study, however, considers the extent to which programme coherence is related to students' perceptions of the importance of theoretical knowledge for professional practice.

The development of programme coherence and identification of the relevance of abstract theories for professional practice may be a combined solution to the tension between theory and practice (Hammerness, 2006). Smeby and Heggen (2014) suggest that perceived relevance of teaching to practice and of practice to teaching is important for students to further learning.

Facilitating coherence in professional programmes implies that training in practice builds on acquired theoretical knowledge. This concept also implies that links between practical experiences and theory are identified in classroom instruction, as well as during guidance conversations at the time of placement. In addition, the practical experiences encountered during placement can provide a better understanding of the theoretical content of the programme. Helping students to link theory and practice experiences might contribute to them forming meaningful relationships in the programme and could play a part in enabling them to reflect on their own and others' professional practices. This type of support might also help students understand the relevance of the theoretical knowledge emphasised in the

classroom to placement practices. Developing students' reflective and critical thinking skills has been proposed to bridge the gap between theory and practice and to develop and articulate tacit knowledge (Clarke, 1986; Johns & Joiner, 2002; Benner, Tanner, Christine, & Chesla, 2009). Curriculum design may help students reflect upon professional practice and sense a connection between what they learn in the classroom and what they do in the field. Coherence, then, has a positive impact on students' assessments of the importance of theoretical knowledge for professional practice.

A student's recognition of theoretical knowledge as an important prerequisite for professional practice, however, is not simply the result of college teachers and placement supervisors emphasising the relevance of theory for professional practice. This recognition is also connected to the student's previous understanding and learning endeavours. Previous research suggests that the manner in which students exploit the learning opportunities provided by their institution affects their learning outcomes (Kuh, Kinzie, Buckley, Bridges, & Hayek, 2014; McCormic, Kinzie, & Gonyea, 2013; Watkins, 2001; Zimmermann & Schunk, 2001). Therefore, it is reasonable to expect that students' perceptions of coherence as well as his or her study effort are related to the recognition of theoretical knowledge as an important prerequisite for professional practice.

College teachers', placement supervisors' and students' experiences

Teachers and placement supervisors can disagree in their epistemological beliefs regarding their valuation of the importance of theoretical knowledge for professional practice. These groups can also emphasise programme coherence to varying extents, meaning they differ in the weight they place on linking theory to practice. Students, however, experience the educational content as a whole; therefore, we asked them to what extent they *experience* the relationship of theory to practice presented by their college teachers and placement

supervisors and we asked them about their valuation of the importance of theoretical knowledge for future professional practice.

The three professional programmes compared in this paper are all composed of subject matter that originated from different fields of scientific knowledge and do not constitute a coherent professional knowledge base. Newly qualified nurses, social workers and general teachers report a gap between what is taught in the educational programmes and the professional competence required at the workplace. General teachers experience this the most and social workers the least (Smeby & Heggen, 2014). Moreover, there are important differences among how third-year students assess the importance of theoretical knowledge for professional practice. Contrarily, there were no significant differences among first-year students' assessments, yet the importance of theoretical knowledge increased among nursing students and decreased among general teacher-training students (Heggen, 2008).

In this paper, we will examine the following questions with respect to nursing, social work and general teacher-training programmes:

1. Is there an epistemological clash between placement supervisors and college teachers?
2. To what extent do supervisors' and college teachers' in the respective programmes emphasise programme coherence?
3. Do students' perceptions of programme coherence correspond to supervisors' and college teachers' emphases on programme coherence in the respective programmes?
4. Does programme coherence affect students' assessments of the importance of theoretical knowledge for professional practice?

Methodology

Sample and response rate

The aim of this study is to map general epistemological beliefs and valuations of programme coherence among large groups of college teachers, placement supervisors and

students. This study is based on a large and relatively unique data set, in which the different groups of respondents are asked comparable questions in various surveys. Data were drawn from surveys distributed at a select number of educational institutions among students, college teachers and placement supervisors in nursing, social work and general teacher-training programmes in Norway.¹ Table 1 presents an overview of the responses provided by the different groups. The questionnaires map many aspects of students', college teachers' and supervisors' self-reported valuations related to the educational programmes and consisted of 81–271 items each.

The surveys among the students were conducted in Spring 2007. The students in the nursing and social work programmes were in their third, and final, years of study. In the general teacher-training programme, which is a four-year, full-time programme, students were evaluated in their third year of compulsory studies. In the fourth year of the programme, the students choose their study topics, and approximately a third gets recognition for previous education that eliminates the need for further schooling. This means that many of the respondents in this group were at the end of their four-year general teacher-training education, whereas most respondents still had one year left.

The survey among college teachers was conducted in 2008 for the general teacher-training programme and in late 2009 and early 2010 for the nursing and social work programmes. The survey among the placement supervisors was conducted in 2008 for the general teacher-training programme and in late 2010 and early 2011 for the nursing and social work programmes.

Table 1 shows that the response rate for placement supervisors in the nursing programme was relatively low (32%). In addition to a regular reminder, extensive measures

¹ For a more comprehensive description of the surveys used in this article, visit <http://www.hioa.no/Forskning-og-utvikling/Hva-forsker-HiOA-paa/FoU-SPS/Kvantitative-databaser-ved-SPS>

were taken to increase the response rate. The deans of the various educational institutions were involved in requesting that the contact nurses at each placement site encourage the placement supervisors to complete the survey. The nurse placement supervisors were offered the questionnaire in paper and online formats because there were many nurses who were unable to answer the survey during working hours due to lack of access to computers or the Internet. However, it is possible that the low response rate for placement supervisors in the nursing programme implied that only the most dedicated placement supervisors answered the survey, which may have been reflected in this group's responses. To what extent there were systematic differences between the perceptions among placement supervisors in the nursing programme who responded to this survey is unknown. Nevertheless, the low response rate among placement supervisors in the nursing programme was a major limitation, and the data for this group should be interpreted with caution.

Data analysis

Research Question 1 was examined using a *t*-test to compare the mean scores of placement supervisors' and college teachers' epistemological beliefs (an index) within each profession. All the differences in mean scores for this study were statistically significant ($p < .05$). Reliability analyses and inter-item correlation analyses (Pearson *r*) were used to test the internal consistency between the different items for each index. DeVillis (2003) recommended a minimum level of 0.7 for Cronbach's alpha; however, Cronbach's alpha values are dependent on the number of items included. Briggs and Cheek (1986) recommended that for indexes composed by relatively few items, the mean inter-item correlation values should be included, and an optimal mean inter-item correlation value range of 0.2–0.4 should be considered.

The epistemological beliefs among college teachers and placement supervisors in the nursing programme was an additive index based on the respondents' emphases on nursing-specific theoretical knowledge, medical/natural scientific knowledge and social scientific knowledge in their teaching and tutoring. Cronbach's alpha values were 0.66 for college teachers and 0.75 for placement supervisors. The inter-item correlation between the items ranged from 0.30 to 0.50 for college teachers and 0.40 to 0.59 for placement supervisors.

In the social work programme, epistemological beliefs among college teachers and placement supervisors was an additive index based on the respondents' emphases on knowledge in social work/social pedagogy, legal knowledge and social, psychological and pedagogical scientific knowledge in their teaching and tutoring. Cronbach's alpha values were 0.60 for college teachers and 0.79 for placement supervisors. The inter-item correlation between the items ranged from 0.26 to 0.47 for college teachers and 0.48 to 0.72 for placement supervisors.

In the general teacher-training programme, epistemological beliefs among college teachers was an additive index based on two items regarding their emphases on subject-specific knowledge and didactic knowledge in their teaching. Epistemological beliefs among placement supervisors in the general teacher-training programme was an additive index based on the respondents' evaluations of the importance of three statements for achieving success as a general teacher: having good subject knowledge, having good knowledge about child and youth development, and having good knowledge about learning. Cronbach's alpha values were 0.58 for college teachers and 0.70 for placement supervisors. The inter-item correlation was 0.41 for college teachers and ranged from 0.34 to 0.60 for placement supervisors. For all groups, the respondents' assessments of the statements about epistemological beliefs were measured on a 5-point Likert scale (0 = *none* to 5 = *a lot*).

Research Question 2 was examined using a one-way analysis of variance (ANOVA) Bonferroni post-hoc multiple comparisons test to compare the group means of the placement supervisors and college teachers' evaluations of items measuring programme coherence within each sample.

Research Question 3 was examined using a linear regression analysis to find the relationship between the indexes measuring students' views of the importance of theoretical knowledge for professional practice, teaching coherence, placement coherence and study effort. Teaching coherence corresponds to programme coherence experienced in classroom instruction, and placement coherence corresponds to programme coherence experienced at the placement. In addition, the student groups' mean scores for the various indexes were compared using a one-way ANOVA Bonferroni post-hoc multiple comparisons test.

Students' evaluations of the importance of theoretical knowledge for professional practice was an additive index based on their evaluations of three statements on the importance of theoretical knowledge for professional practice: “Theoretical knowledge is an important prerequisite for good professional practice”, “Theoretical teaching is not of little value for future professional work” and “When I start working as a professional, I'm confident that I'm going to read the theoretical parts of the curriculum once again”. The students' assessments of the three statements were measured on a 5-point Likert scale (0 = *disagree* to 5 = *agree*). Cronbach's alpha values were 0.46 for nursing students, 0.47 for social work students and 0.44 for teaching students. The inter-item correlation among the items ranged from 0.17 to 0.29.

Teaching coherence was an additive index based on students' evaluations of three statements about the relationship between classroom instruction and professional practice: “The teachers encourage us regularly to reflect on the relationship between theory and practice”, “Coherence between what we learn and future work is strongly emphasised” and

“Problems we students experience during placement periods are often taken as a point of departure for teaching”. The students' assessments of the three statements were measured on a 7-point Likert scale (1 = *disagree* to 7 = *agree*). Cronbach's alpha values were 0.61 for nursing students, 0.70 for social work students and 0.72 for teaching students. The inter-item correlation between the items ranged from 0.26 to 0.56.

Placement coherence was an additive index based on students' assessments of three statements about the relationship between placement and the theoretical parts of the study: “Supervisor has helped me to integrate theory and practice”, “Experience from placement has been important in my further study” and “Placement training continued what I learned in other parts of the study”. The students' assessments of the three statements were measured on a 5-point Likert scale (1 = *not at all* to 5 = *to a very high degree*). Cronbach's alpha values were 0.63 for nursing students, 0.69 for social work students and 0.60 for teaching students. The inter-item correlation among the items ranged from 0.31 to 0.59.

Study effort was an additive index based on two items: “I prepare myself thoroughly for class” and “I often read literature relevant to my profession”. These two items were measured on a 7-point Likert scale (1 = *disagree* to 7 = *agree*). Cronbach's alpha values were 0.59 for nursing students, 0.48 for social work students and 0.52 for teaching students. The inter-item correlation between the items ranged from 0.35 to 0.42.

Results

Epistemological beliefs among placement supervisors and college teachers

College teachers' and placement supervisors' epistemological beliefs are presented in Figure 1. Epistemological beliefs for the different respondent groups, on average, were on the upper end of the scale, meaning that both college teachers and placement supervisors recognised the importance of theoretical knowledge as a prerequisite for professional

practice. Furthermore, no significant differences existed between the mean scores for college teachers' and placement supervisors' epistemological beliefs within the social work and the general teacher-training programmes. In the nursing programme, however, the college teachers had a significantly higher mean score than did the placement supervisors ($p < .001$). This discrepancy was caused by a significant difference in mean scores in only one of the items, namely, nursing-specific theoretical knowledge, where the mean scores were 4.6 for college teachers and 3.5 for placement supervisors.

Placement supervisors' emphases on coherence

Placement supervisors' assessments of programme coherence during their counselling conversations with students are presented in Figure 2. The placement supervisors in the social work programme reported that students to a greater degree referred to various theories in the counselling conversations, than did the students in the other two programmes. Figure 2 also shows that the placement supervisors in the social work programme to a greater extent related observations of professional practice to theory than did the practice supervisors in the general teacher-training programme, where this occurs less frequently.

College teachers' emphases on coherence

College teachers' assessments of programme coherence in their classroom instruction are presented in Figure 3. The results showed no significant differences in mean scores among the various groups concerning college teachers' usage of students' experiences from practice in their teaching. However, although the mean values were at the lower end of the scale for all three groups of college teachers, the college teachers in the general teacher-training programme found it significantly more difficult to draw on students' practical experiences in their classroom instruction than college teachers in the other programmes did.

Students' assessments

The results of the comparisons of mean scores between the student groups for each index (Table 2) revealed that the mean score for the importance of theoretical knowledge for professional practice for nursing students was significantly higher than the scores for the other student groups. In addition, the mean score for social work students was significantly higher than the mean score for teaching students.

For teaching coherence, the mean score for social work students was significantly higher than the mean scores for the other student groups, and the mean score for nursing students was significantly higher than the mean score of the teaching students.

The mean scores for the nursing and social work students regarding placement coherence were significantly higher than the scores for the teaching students. The mean score for nursing students regarding study effort was significantly higher than both the social work and teaching students' mean scores.

The results of the comparisons of the index scores revealed that the teaching students valued theoretical knowledge as important for professional work to a lesser degree than the other groups valued it. The comparisons also showed that teaching students experienced less emphasis on coherence between theory and practice in classroom instruction, as well as in the placements. Furthermore, nursing students valued the importance of theoretical knowledge the most and reported the highest levels of study effort. However, nursing students also experienced less coherence between theory and practice in classroom instruction compared with the social work students.

The results of the standard multiple regression analysis (Table 3) revealed that the indexes placement coherence, teaching coherence and study effort affected students' evaluations of the importance of theoretical knowledge for professional practice in each of the educational programmes. However, the unique effect of each independent variable varied

in significance among the programmes. For nursing students, the experience of coherence in practice and, to a certain degree, of coherence in classroom instruction had separate influences on their evaluations of the importance of theoretical knowledge for professional practice. For social work students, the experience of coherence in both classroom instruction and at the placement and their study efforts had separate significant effects on their evaluations of the importance of theoretical knowledge for professional practice. Teaching students' evaluations of the same indexes were primarily influenced by their study efforts and, to a lesser extent, their placement coherence.

Discussion

The results do not corroborate the notion of clashing epistemological beliefs between the educational field and the field of practice (Research Question 1) identified by Joram (2007) or the notion that professional education is out of step (Fauske et al., 2005). Research-based theoretical knowledge is considered a prerequisite for good professional practice by the placement supervisors and college teachers. Only in the nursing programmes were there minor discrepancies between college teachers' and placement supervisors' emphasis on theoretical knowledge, and the divergence was due to their different emphases on nursing-specific knowledge. There has been extensive conflicts within nursing as to whether the knowledge base first and foremost should be linked to care, ethics and practical knowledge or rather scientific medical knowledge and evidence based methods (Lund, 2012; Tveit, 2008). However, the lack of an epistemological clash between the educational field and the field of practice might be caused by our operationalisation. In our study, we analysed the respondents' evaluations of one dimension of professional competence, namely, the evaluation of the importance of theoretical knowledge for professional practice. Joram (2007), however, focused on the respondents' assessments of research and its generalisability and falsifiability. One might question whether it is reasonable to expect practitioners to have the same

appreciation for and insight into research and its applicability as do college teachers.

Research is, after all, a key feature in the job description of college teachers. Nevertheless, our findings do not support the hypotheses of clashing epistemological beliefs between placement supervisors and college teachers. The content of a professional education programme is ultimately justified by its relevance to practice (Smeby, 2008). Our question was formulated as a general statement, and there may be significant disagreements on the relevance of the specific theoretical content of a programme. However, our aim was to examine general epistemological beliefs on whether theoretical knowledge is important for professional practice.

The lack of epistemological clash may be considered to be in line with the critics of the situated approach (Hughes, Jewson, & Unwin, 2007). Moreover, our analyses of coherence corresponds to the perspectives on boundary crossing (Tuomi-Gröhn & Engström, 2003). In the general teacher-training programme, the placement supervisors gave less emphasis to linking theory to practice, and the college teachers found it more difficult to draw on students' practical experiences in their classroom instruction than did the teachers in the nursing and social work programmes (Research Question 2). In addition, the students in the general teacher-training programme perceived less emphasis on coherence between theory and practice in both classroom instruction and field placement compared with students in the other two groups (Research Question 3). The lack of coherence and the importance of enhancing coherence between the on-campus teaching and students' practical field experiences in the teacher-training programme has also been emphasised in other studies (Darling-Hammond, 2006; Grossman et al., 2008; Korthagen & Kessels, 1999).

The results of the regression analysis of students' evaluations of the importance of theoretical knowledge for professional practice, coupled with their experience of programme coherence and study effort, reveal that programme coherence relates significantly to students'

points of view on the importance of theoretical knowledge for professional practice, especially for nursing and social work students (Research Question 4). For teaching students, however, programme coherence had only a limited separate effect, whereas students' study efforts had a substantial separate effect on their evaluations of the importance of theoretical knowledge for professional practice. Recontextualising knowledge is challenging, but it also enhances learning (Engeström & Sannino, 2010; van Oers, 1998).

An overall review of students', college teachers' and placement supervisors' evaluations of coherence in the study programmes show that the general teacher-training programme faces greater challenges in linking theory to practice in classroom instruction and at the time of placement than do the other programmes. The nursing programme also encountered some difficulties in relating theory to practice in the classroom setting.

The degree to which students perceive an emphasis on programme coherence appears to influence students' evaluations of the importance of theoretical knowledge for professional practice. Where programme coherence is emphasised to a lesser degree, the students' own study efforts had the greatest effect on their evaluations of the importance of theoretical knowledge for professional practice. This finding indicates that when students do not experience program coherence between theory and practice, they must endeavour to see the relevance of theoretical knowledge for professional practice on their own. However, this action could be problematic. Previous research conducted by Newton, Billett, Jolly, and Ockerby (2009) indicated that students' study efforts were affected by their experience of theoretical knowledge being linked to practical problems by their placement supervisors. Viewing our results together with these findings suggests that expectations for students to make the connections between theoretical knowledge and practical use could lead to self-reinforcing negative effects. Thus, when the lack of clarification of the relevance of theoretical knowledge negatively affects students' study efforts, it becomes especially

problematic that students' study efforts are the sole factor positively influencing their view of theoretical knowledge as important for professional practice. Likewise, when placement supervisors and college teachers emphasise and clarify the link between theoretical knowledge and practical problems, it could have a self-reinforcing positive effect. This emphasis could motivate students and lead to increased study efforts. However, a limitation to our study is that we only know that study efforts and programme coherence shared some of the same variances with the view of theoretical knowledge as important for professional practice. The aim of this study was not to analyse whether there was a significant effect of programme coherence on students' study efforts; thus, this might be an interesting topic for future research. A comparative study, such as this, is foremost suited to uncover similarities and differences in students' evaluations of programme coherence and the importance of theoretical knowledge among the programmes. This study has not investigated whether there are variations in how theories are taught in the various programmes. Another interesting subject for further investigation would, thus, be to do a comparison of how theoretical knowledge is actually being taught in the different programmes and how professional education best facilitates students' boundary crossing and develops their ability to recontextualise knowledge between the classroom context and professional practice.

Concluding remarks

The findings reveal that there is no indication of clashing epistemological beliefs between the education and practice arenas. Both college teachers and placement supervisors regard theoretical knowledge as an important element of professional competence. One reason for this regard may be that research-based and evidence-based practices are emphasised in all professional fields (Grimen & Terum, 2009; Smeby, 2015).

Our findings imply that a lack of programme coherence and study efforts might be an essential explanation for students' perceptions of theoretical knowledge as important for professional practice. Our analyses of the students', college teachers' and placement supervisors' assessments of the emphases on the relationship between theoretical knowledge and professional practice shows that the general teacher-training programme faces greater challenges in linking theoretical knowledge to practical use in both the classroom and placement settings than do the other programmes. Classroom instruction in the nursing programme also has some challenges clarifying how parts of the nursing-specific theoretical knowledge can be relevant to professional practice.

We have examined the perceived importance and relevance of theoretical knowledge based on general concepts. However, students' experiences are not just dependent on how college teachers and placement supervisors emphasise coherence; these experiences also related to the relevance of the theoretical knowledge base. There is, therefore, a need for more in-depth studies to develop our understanding of the role and relevance of theoretical knowledge in professional practice further. We also suggest that boundary crossing and recontextualisation may be appropriate points of departure to underscore the idea that development of students' recognitions of meaningful relationships between theory and professional practice are demanding processes but important opportunities for professional learning.

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Appendix A: Tables

Table 1. Students, college teachers and placement supervisors in nursing, social work, pre-school teaching and general teacher-training programmes participating in this study. Response rate and absolute numbers.

	Nursing		Social work		General teacher training	
	Response rate	n	Response rate	n	Response rate	n
Students	71 %	446	74 %	539	71 %	362
College teachers	67 %	210	72 %	144	60 %	545
Placement supervisors	32 %	253	53 %	237	62 % ¹	389

¹ The survey among the supervisors in the general teacher-training programme was part of a larger study among general teachers; 2205 general teachers responded and their response rate was 62%, 389 of these teachers were placement supervisors². However, we do not have the exact response rate for the placement supervisors because there is no record of the total number of placement supervisors in the sample.

Table 2. Nursing students', social work students' and student teachers' evaluations of the importance of theoretical knowledge for professional practice, study effort and teaching coherence and placement coherence in the educational programme. Mean and standard deviation (SD).

	The importance of theoretical knowledge for professional practice		Teaching coherence		Placement coherence		Study effort	
	Mean	SD	Mean	SD	Mean	SD	Mean	SD
Nursing students (N = 446)	4.1	.652	3.8	1.155	4.0	.686	4.1	1.332
Social work students (N = 539)	3.9	.652	4.3	1.199	3.9	.824	3.6	1.314
Student teachers (N = 362)	3.6	.635	3.5	1.189	3.5	.720	3.5	1.128
Scale	Six-point scale ranging from 0 = disagree, 5 = agree		Seven-point scale ranging from 1 = disagree, 7 = agree		Five-point scale ranging from 1 = not at all, 5 = to a very high degree		Seven-point scale ranging from 1 = disagree, 7 = agree	

² <http://hio.no/content/view/full/57424>

Table 3. The impact of teaching coherence, placement coherence and study effort on evaluations of the importance of theoretical knowledge for professional practice among nursing students, social work students and student teachers. Unstandardized regression coefficient (B) and standard error (SE).

	Nursing students		Social work students		Student teachers	
	B	SE	B	SE	B	SE
Teaching coherence	.069 *	.029	.155 ***	.024	.075 *	.031
Placement coherence	.203 ***	.050	.105 **	.035	.066	.051
Study effort	.048	.025	.064 **	.022	.168 ***	.028
(Constant)	2.815 ***		3.919 ***		2.545 ***	
Adjusted R ²	.077		.138		.131	
N	446		539		362	

Note: * p <.05, ** p <.01, *** p <.001

Appendix B: Figures

Figure 1. College teachers' and placement supervisors' epistemological beliefs in the nursing, social work and general teacher-training programmes on a six-point scale (0 = none to 5 = a lot). Mean.

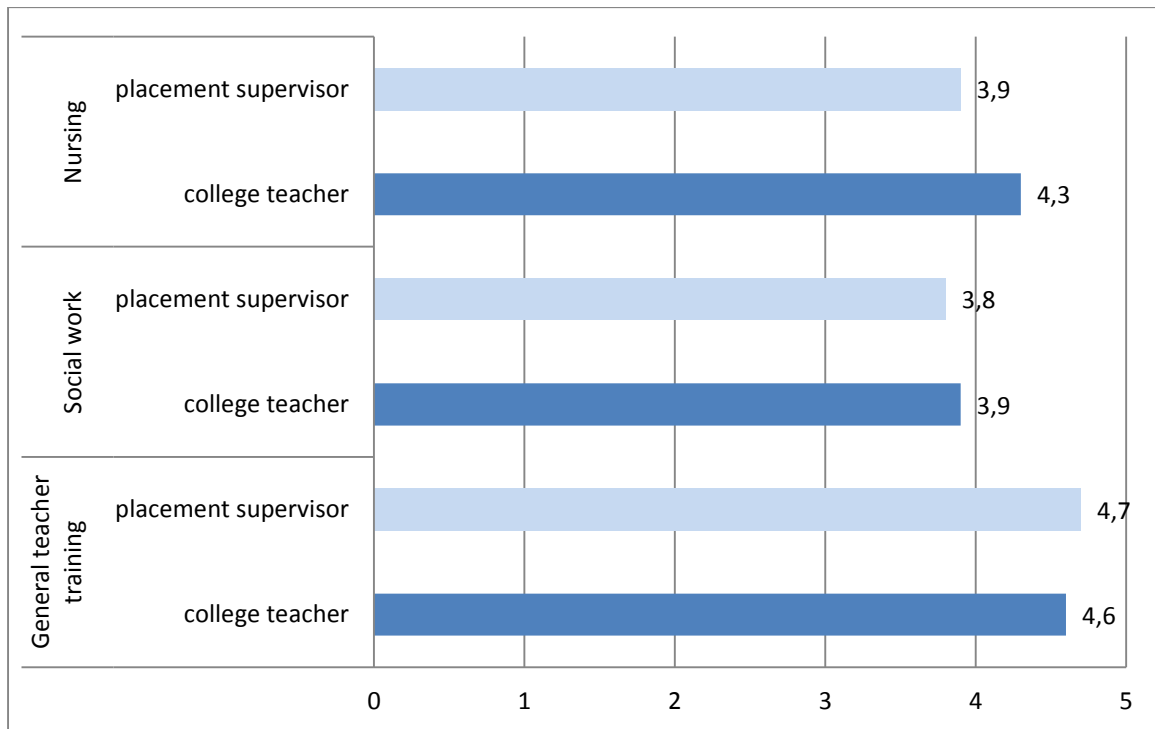


Figure 2. Placement supervisors' evaluations of the extent of emphasis on the link between theory and practice in the counselling conversations at the placement periods in the nursing, social work and general teacher-training programmes on a six-point scale (0 = never to 5 = very often). Mean.

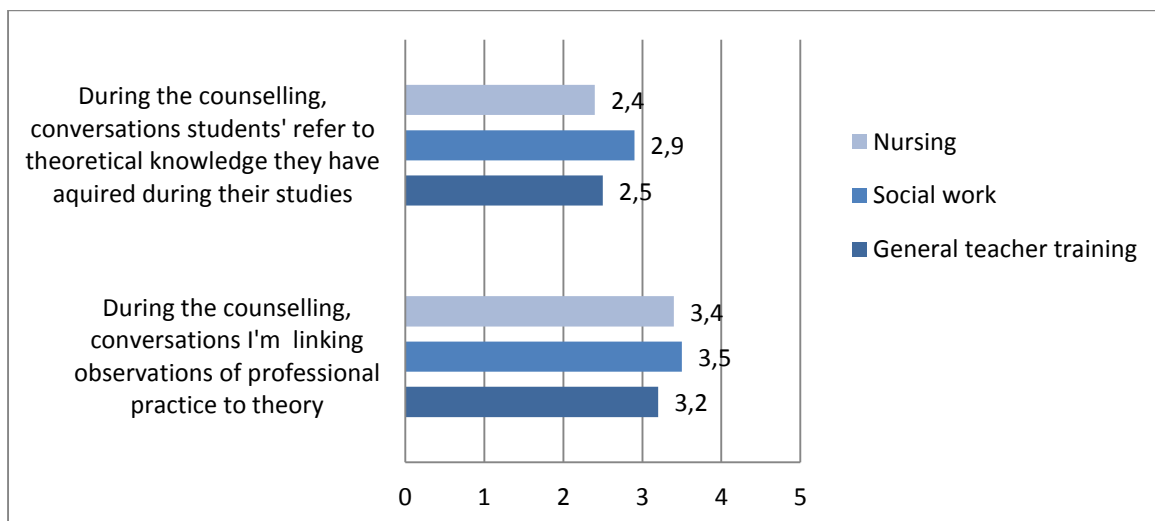


Figure 3. College teachers' uses of students' practical experiences in their teaching at the nursing, social work and general teacher-training programmes on a six-point scale (0 = *totally disagree* to 5 = *totally agree*). Mean.

