



Editorial: Perspectives on teachers' transdisciplinary professional competence

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Abstract

What are the prevalent understandings of the concept of teachers' professional competence? What knowledge forms and learning arenas are significant in developing teacher competencies for the 21st century? In what ways can transdisciplinary goals of teacher education, such as diversity, research and development (R&D) and digital competence, contribute to forming teachers' professional competence? This special issue's contributions address a variety of perspectives on core concepts for understanding the complexity of teachers' professional competence. They define, question and criticize the prevalent epistemological and ontological understandings within teacher qualification. They include theoretical and empirical papers addressing a variety of perspectives on teacher qualification and teachers' professional competence, with a particular focus on the role of modes of knowledge, learning arenas and multidisciplinary as contributors to transdisciplinary goals in teacher qualification. In addition, contributions illustrate dimensions of teachers' professional competences.

Keywords: teachers' professional competence, transdisciplinary competence, digital competence, diversity competence, R&D competence, learning arenas, modes of knowledge

Introduction

The qualifications and competencies that teachers need, and that must be developed through initial teacher education, are ever-evolving. To be prepared for a rapidly changing

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and digital society, students need skills such as deeper learning, analytic reasoning, complex problem solving and teamwork (Binkley et al., 2012; Partnership for 21st century learning, 2007). Simultaneously, research has highlighted how teachers' competencies must build on several modes of knowledge and be developed in different learning arenas. Increasingly, teacher education programs stress transdisciplinary goals: learning outcomes that transcend subject boundaries and cannot be reduced to a sum of goals in discrete subjects.

These transdisciplinary goals require multidisciplinary teacher education design, inter-subject learning activities and teacher education didactics (i.e. Brekke, 2004; Bjørke & Braut, 2009). While research on pedagogy and subject didactics is common, research on multidisciplinary learning processes in different learning arenas is rare (Caspersen et al., 2017; Dahl et al., 2016). This special issue aims at clarifying the concept of teachers' professional competence and gaining insight into student teachers' competencies for the future. The collection of articles presents conceptualizations based on a broad range of perspectives.

This special issue defines, questions and criticizes the prevalent epistemological and ontological understandings within teacher qualification. It includes theoretical and empirical papers addressing a variety of perspectives on teacher qualification and teachers' professional competence, with a particular focus on the role of modes of knowledge, learning arenas and multidisciplinary as contributors to transdisciplinary goals in teacher qualification. In addition, contributions illustrate dimensions of teachers' professional competences such as teachers' diversity competence, teachers' research and development (R&D) competence and teachers' digital competence.

Learning arenas, modes of knowledge and multidisciplinary

The development of student teachers' competencies is complex and must build on several modes of knowledge, occur in different learning arenas and involve transdisciplinary goals.

Three important features of powerful teacher education programs are a common vision, coherence and a strong curriculum grounded in practice (Hammerness, 2013). Teacher education programs are situated in two learning contexts. As researchers, teacher educators view education differently than teachers view education (Bulterman-Bos, 2008). These different views can contribute to fragmentation and a lack of coherence, and the distance between these two *arenas* is often described as a "gap". In addition, teachers in different subject areas may have discipline-specific or personal visions. This may lead to a fragmented, less coherent curriculum and a weak scientific core (Hammerness, 2013).

While teacher education programs are described as fragmented and lacking coherence, researchers claim that *modes of knowledge* in placement schools and on campuses must be different (Jensen et al., 2012). Teachers' professional competence has both an individ-

ual and a collective component (Hargreaves & Fullan, 2012) and can be defined as “professional practice based on a knowledge base that enables handling complex issues related to learning and teaching” (Lund et al., 2015, our translation). The constitution of professional competence is an integrated relationship between theoretical and practical experience-based modes of knowledge.

Developing professional teacher competencies requires integrating different modes of knowledge, rather than engendering conflict between theory and practice (Mausethagen, 2015; Christensen et al., 2018). On-campus learning of theoretical knowledge requires a cognitive understanding that includes analytical and critical reflection (Grimen, 2008; Carlgren, 2012). Learning in practice placements involves practical knowledge, which differs from theoretical knowledge by being developed and implemented by the learner herself (Heggen, 2008; Gee, 2000). Moreover, student teachers will encounter different groups representing different knowledge cultures, both on campus and at placement schools. Such encultured knowledge, which establishes itself in social contexts, is collective, normative and tacit. On the other hand, laws and regulations – embedded knowledge – are operationalised in local institutional structures and procedures like curricula and lesson plans, assessment practices and teaching methods, thereby framing professional practice (Klette & Carlsten, 2012, p. 71).

Campuses and placement schools are very different contexts, but students do not necessarily see this difference as a “gap”. Instead, they see them as involving different modes of knowledge (Christensen et al., 2014). “Transitional coherence” – which encourages coursework that crosses and/or sits on boundaries, which are regarded not only as barriers but also as the departure point for reflection and learning – can help strengthen student teacher motivation and subject-oriented identity (Heggen & Terum, 2013; Akkerman & Bakker, 2011).

The term practical synthesis, coined in research on professions by Harald Grimen (2008), highlights a form of knowledge integration that takes the practical task orientation in professional work as the point of departure. Given the varied qualifications required in the case of teaching professions and initial teacher education, integration of knowledge can perhaps more frequently be found as practical syntheses than as theoretical syntheses. However, theoretical integration can, like practical syntheses, also be more local and include shared vocabularies, common approaches to a research problem, and coordination of methodologies as aspects of integration.

Insight into *multidisciplinary* learning processes is required to address the lack of a common vision, weak coherence and complex knowledge base in teacher education. At the same time, professional knowledge which is important regardless of a student's choice of subject – and therefore is not contained in the curriculum of any individual subject area – deserves more attention.

This special issue presents perspectives on how modes of knowledge may materialise in different learning arenas and through multidisciplinary learning processes and thereby contribute to teachers' professional competencies. The contribution from Raaen and

Thorsen addresses learning arenas and seeks to move the discussion of the so-called “theory-practice gap” away from simple dichotomies. Lund and Lund Hansen present a typology of dimensions of “knowledge” related to teacher education and professional practice. Johannesen and Øgrim present the role of multidisciplinary activities in developing teachers’ professional digital competence and argue that locally implemented material structures are crucial to succeed in building such competencies. Jarning discusses key institutional and intellectual changes in education research in Norway linked to teacher education, spanning fifty years.

Transdisciplinary dimensions of the teaching profession

To gain further insight of the role of learning arenas, modes of knowledge and multidisciplinary in teacher education, it is imperative to understand the complexity of the teaching profession and how transdisciplinary learning processes may contribute in developing such overarching professional competencies. Three transdisciplinary dimensions of the teaching profession are studied in this issue: teachers’ diversity competence, teachers’ R&D competence, and teachers’ digital competence.

The concept of diversity has gained a more prominent place in educational discourse recently, based partly on global trends such as migration and inclusion (UNESCO, 1994). However, the concept needs clarification (Westrheim & Hagatun, 2015; Dyrnes et al., 2015). Recently, the concept has evolved. From its original usages addressing multiculturalism and religion, the concept now includes identity categories such as gender, sexuality, ethnicity, class and functionality (Røthing & Bjørnstad, 2015). The concepts of intersectionality (Crenshaw, 1989), which points to the ways that different aspects of diversity acquire new meanings when viewed in relation to each other (Røthing & Bjørnstad, 2015), and super-diversity, which denotes diversity not only between ethnic groups but also within them (Vertovec, 2007), are further developments of the concept of diversity. In her article, Andresen explores the strategies teachers use to manage different discourses on national identity in classrooms in Oslo, Norway.

The concept of research-based teacher education demands that R&D competence be part of the education in several arenas. Researchers can include different opinions in the concept; (1) the teacher educators as researchers, (2) a research-based subject content and/or (3) student teachers as participants in R&D projects (Vågan & Kyvik, 2014). More tightly integrated programs with practice placement interwoven with on-campus coursework can develop student teachers’ abilities to reflect on practice, both their own and the school’s collective practices (Zeichner, 1983; Darling-Hammond, 2000; Korthagen et al., 2001). Implementing a more R&D-based programme can contribute to understanding how research-based knowledge influences the practice and learning of student teachers (Afdal & Nerland, 2014), and R&D competence will provide student teachers with a basis for practice development. Such competence is practice-oriented and differs from the more academic science competence (Bjørke et al., 2013; Arneback et al., 2016). In Norway,

teachers' R&D competence has been defined to consist of knowledge of research design, quality criteria for research, transparently reports and practical implications for collegial cooperation. To develop these competencies, the attitudes towards R&D-based knowledge play a part, both the affective, cognitive and practical aspects (Kunnskaps-senter for utdanning, 2014). In this issue, Flores analyses the restructuring of teacher education at a Portuguese university in light of the need to reinforce the link between research and teaching, and the Bologna process. Meanwhile, Idris, Eskender, Yosief, Demoz and Andemicael reports on collaborative learning among teacher educators when designing an action research course in teacher education.

Research on digital competencies is rich and illustrates the fragmented nature of the field. On the one hand, the research richly describes the implementation of technology in all educational levels, from kindergarten to higher education (Libbreth, 2015; Gökce et al., 2017; Schackow & Cugini, 2016). Much of this research focuses on the technology itself rather than the educational affordances of using such technology. On the other hand, the definition of the concept of digital competence has been discussed thoroughly in European and Scandinavian research (Ferrari et al., 2014, Erstad, 2010), in particular that of teachers' digital competence (Røkenes & Krumsvik, 2014; Lund et al., 2014; Johannesen et al., 2014; Instefjord, 2014). In recent times models and conceptual frameworks describing and defining teachers' digital competence have emerged, such as DigCompEdu (Redecker, 2017), TPACK (Mishra & Koehler, 2006), TETCs (Foulger et al., 2017) and professional digital competence framework (PfdK) (Kelentric et al., 2017). Although the existing research thoroughly describes the concept of professional digital competence as the combined digital, content-related and pedagogical competencies that all teachers, including teacher educators, must hold to be a professional in the 21st century, there is insufficient research on the deeper understanding of educational practices, as described and discussed by for example Gudmundsdottir and Hatlevik in this special issue. They look specifically at responsible use of ICT and how student teachers' in Norway are prepared for this. Lund and Aagaard, in their article, examines emerging epistemologies resulting from digitalization, and concludes that teacher education does not currently prepare student teachers for these changes.

Smestad and Gillespie provide a systematic review of how teachers' professional competence is conceptualized in recent research on teachers' digital, diversity and R&D competence, providing a list of dimensions wherein tensions in the research can be found.

Transdisciplinary dimensions of the teaching profession

Teacher education is a complex endeavour, and researchers tend to be experts in limited areas. We believe that this complexity of teacher education can only be understood when researchers work across subjects, across arenas and modes of knowledge. We hope that

this special issue contributes to the development of the discussion of teachers' professional competence, in which different transdisciplinary competencies, different learning arenas and modes of knowledge, are studied together.

References

- Afdal, H. W. & Nerland, M. (2014). Does teacher education matter? An analysis of relations to knowledge among Norwegian and Finnish novice teachers. *Scandinavian Journal of Education*, 58(3), 281-298. <http://dx.doi.org/10.1080/00313831.2012.726274>
- Akkerman, S. F. & Bakker, A. (2011). Boundary crossing and boundary objects. *Review of Educational Research*, 81, 132-169. <http://dx.doi.org/10.3102/0034654311404435>
- Arneback, E., Englund, T., & Solbrekke, T. D. (2016). Writing in and out of control – A longitudinal study of three student teachers' experiences of academic writing in preschool teacher education. *Nordic Studies in Education* 36(3), 211-228. <http://dx.doi.org/10.18261/issn.1891-5949-2016-03-03>
- Binkley, M., Erstad, O., Herman, J., Raizen, S., Ripley, M., Miller-Ricci, M. & Rumble, M. (2012). Defining twenty-first century skills. In P. Griffin, B. McGaw & E. Care (Eds.), *Assessment and teaching of 21st Century skills* (pp. 17-66). Springer. http://dx.doi.org/10.1007/978-94-007-2324-5_2
- Bjørke, G. & Braut, G. S. (2009). To karrierevegar – jamstilte, men ulike. *Uniped*, 32(4), 40-50.
- Bjørke, G., Jarning, H., & Eikeland, O. (Eds.) (2013). *Ny praksis - ny kunnskap: om utviklingsarbeid som sjanger*. ABM-media AS.
- Brekke, M. (Ed.).(2004). *Norsk lærerutdanningsdidaktikk i endring. Læring, undervisning og danning i lys av ny forskning*. Høgskoleforlaget.
- Bulterman-Bos, J. A. (2008). Relevance in educational research. Will a clinical approach make education research more relevant for practice? *Educational Researcher*, 37(7), 412-420. <https://doi.org/10.3102%2F0013189X08325555>
- Carlgren, I. (2012). Kunnskap för bildning? In T. Englund, E. Forsberg & D. Sundberg (Eds.), *Vad som räknas som kunnskap? Läroplanteoretiska utsikter och inblickar i lärarutbildning och skola*. Liber AB.
- Caspersen, J., Bugge, H., & Oppegaard, S. M. N. (2017). *Humanister i lærerutdanningene. Valg og bruk av pensum, kompetanse og rekruttering, faglig identitet og tilknytning*. HiOA.
- Christensen, H., Eikeland, O., Hellne-Halvorsen, E.-B., & Lindbo, I.-M. (Eds) (2018). *Vitenskapelighet og kunnskapsforståelse i profesjonene*. Universitetsforlaget.
- Christensen, H., Eritsland, A. G., & Havnes, A. (2014). Bridging the gap? Student attitudes about two learning arenas in teacher education. A study of secondary teacher students' experiences in university and practice. In E. Arntzen (Ed.), *Educating for the future: Proceedings of the ATEE 38th Annual Conference 2013* (pp. 46–61). ATEE/Høgskolen i Østfold.
- Crenshaw, K. (1989). Demarginalizing the intersection of race and sex: A black feminist critique of antidiscrimination doctrine, feminist theory and antiracist politics. *University of Chicago Legal Forum*, 1989(1), Article 8. <http://dx.doi.org/10.4324/9780429499142-5>
- Dahl, T., Askling, B., Heggen, K., Kulbrandstad, L. I., Lauvdal, T. Mausethagen, S., Qvotrup, L., Salvanes, K. G., Skagen, K., Skrøvset, S., & Thue, F. W. (2016). *Om lærerrollen. Et kunnskapsgrunnlag*. Fagbokforlaget.
- Darling-Hammond, L. (2000). How teacher education matters. *Journal of Teacher Education*, 51(3), 166-173. <http://dx.doi.org/10.1177/0022487100051003002>
- Dyrnes, E. M., Johansen, G., & Jónsdóttir, G. (2015). Hvordan forbereder PPU lærerstudenter på møtet med det flerkulturelle klasserommet? *Norsk pedagogisk tidsskrift*, 99(03-04), 220-232.
- Erstad, O. (2010). *Digital kompetanse i skolen*. Universitetsforlaget.
- Ferrari, A., Brecko, B., & Punie, Y. (2014). DIGCOMP: A framework of developing and understanding digital competence in Europe. *openeducationeuropa.eu, eLearning papers, No 38*, 1-14.
- Foulger, T. S., Graziano, K. J., Schmidt-Crawford, D. A., & Slykhuis, D. A. (2017). Teacher Educator Technology Competencies. *Journal of Technology and Teacher Education*, 25(4), 413-448.

- Gee, J. P. (2000). Identity as an analytic lens for research in education. *Review of Research in Education*, 25, 99-125. <http://dx.doi.org/10.2307/1167322>
- Grimen, H. (2008). Profesjon og kunnskap. In A. Molander & L. I. Terum (Eds.), *Profesjonsstudier* (s. 71- 86). Universitetsforlaget.
- Gökçe, S., Yenmez, A. A., & Özpınar, I. (2017). An Analysis of Mathematics Education Students' Skills in the Process of Programming and Their Practices of Integrating It into Their Teaching. *International Education Studies*, 10(8), 60-76. <https://doi.org/10.5539/ies.v10n8p60>
- Hammerness, K. (2013). Examining features of teacher education in Norway. *Scandinavian Journal of Educational Research*, 57(4), 400–419. <http://dx.doi.org/10.1080/00313831.2012.656285>
- Hargreaves, A. & Fullan, M. (2012). *Professional capital: Transforming teaching in every school*. Routledge.
- Heggen, K. & Terum, L. I. (2013). Coherence in professional education: Does it foster dedication and identification? *Teaching in Higher Education*, 18(6), 656-669. <http://dx.doi.org/10.1080/13562517.2013.774352>
- Heggen, K. (2008). Social workers, teachers and nurses—from college to professional work. *Journal of Education and Work*, 21(3), 217-231. <http://dx.doi.org/10.1080/13639080802214076>
- Instefjord, E. (2014). Appropriation of digital competence in teacher education. *Nordic Journal of Digital Literacy*, 2014(04), 313-329.
- Jensen, K., Lahn, L., & Nerland, M. (Eds.) (2012). *Professional learning in the knowledge society*. Sense Publishers.
- Johannesen, M., Øgrim, L., & Giæver, T. H. (2014). Notion in motion: Teachers' digital competence. *Nordic Journal of Digital Literacy*, 2014(04).
- Kelentrić, M., Helland, K., & Arstorp, A.-T. (2017). *Professional digital competence. Framework for teachers*. https://www.udir.no/globalassets/filer/in-english/pfdk_framework_en_low2.pdf
- Klette, K. & Carlsten, T. C. (2012). Knowledge in teacher learning: New professional challenges. In Jensen, K., Lahn, L., & Nerland, M. (Eds). *Professional learning in the knowledge society* (pp. 69-84). Sense Publishers.
- Korthagen, F. A., Kessels, J., Koster, B., Lagerwerf, B., & Wubbels, T. (2001). *Linking practice and theory: The pedagogy of realistic teacher education*. Routledge.
- Kunnskapssenter for utdanning. (2014). *FoU i lærerutdanningen*. Syntesenotat 1/2014. Norges forskningsråd.
- Libbrecht, P. (2015). Adaptations to a Learning Resource. *Acta Didactica Napocensia*, 8(1), 67-74. <https://www.learntechlib.org/p/158317/>
- Lund, A., Furberg, A., Bakken, J., & Engelién, K. L. (2014). What does professional digital competence mean in teacher Education? *Nordic Journal of Digital Literacy*, 2014(04).
- Lund, A., Jakhelln, R. E. & Rindal, U. E. (2015). Fremragende lærerutdanning – hva er det, og hvordan kan vi få det? In A. Lund, R. E. Jakhelln & U. E. Rindal (Eds.), *Veier til fremragende lærerutdanning* (pp. 13-36). Universitetsforlaget.
- Mausethagen, S. (2015). *Læreren i endring? Om nye forventninger til lærerprofesjonen og lærerarbeidet*. Universitetsforlaget.
- Mishra, P. & Koehler, M. J. (2006). Technological pedagogical content knowledge: A framework for teacher knowledge. *Teachers College Record*, 108(6), 1017-1054. <http://dx.doi.org/10.1111/j.1467-9620.2006.00684.x>
- Partnership for 21st century learning (2007). *Partnership for 21st century learning: Framework for 21st century learning*. <http://www.p21.org/about-us/p21-framework>
- Redecker, C. (2017). *European framework for the digital competence of educators*. DigCompEdu [PDF file]. Joint Research Centre, Seville. http://publications.jrc.ec.europa.eu/repository/bitstream/JRC107466/pdf_digcomedu_a4_final.pdf
- Røkenes, F. M. & Krumsvik, R.J. (2014). Development of student teachers' digital competence in teacher education - a literature review, *Nordic Journal of Digital Literacy*, 2014(04), 250-280.
- Røthing, Å. & Bjørnstad, E. (2015). Kompetanse for mangfold. *Norsk pedagogisk tidsskrift* 99(03-04).
- Schackow, J. B. & Cugini, S. (2016). Algebra? There's an App for That: Florida Goes Online with Math Support for Teachers and Students. *Journal of Staff Development*, 37(4), 35-39.
- UNESCO. (1994). *The Salamanca Statement and Framework for Action on Special Needs Education: Adopted by the World Conference on Special Needs Education; Access and Quality. Salamanca, Spain, 7-10 June 1994*. Unesco.
- Vågan, A. & Kyvik, S. (2014). Forskningsbasert grunnskolelærerutdanning. *Bedre skole*, nr. 4, 21–25.

- Vertovec, S. (2007). Super-diversity and its implications, *Ethnic and Racial Studies*, 30(6), 1024-1054. <http://dx.doi.org/10.1080/01419870701599465>
- Westrheim, K. & Hagatun, K. (2015). Hva betyr «kompetanse for mangfold» i utdanningssystemet? - Et kritisk perspektiv på mangfolddiskursen. *Norsk pedagogisk tidsskrift*, 99(03-04), 168-180.
- Zeichner, K. M. (1983). Alternative paradigms of teacher education. *Journal of Teacher Education*, 34(3), 3-9. <http://dx.doi.org/10.1177/002248718303400302>